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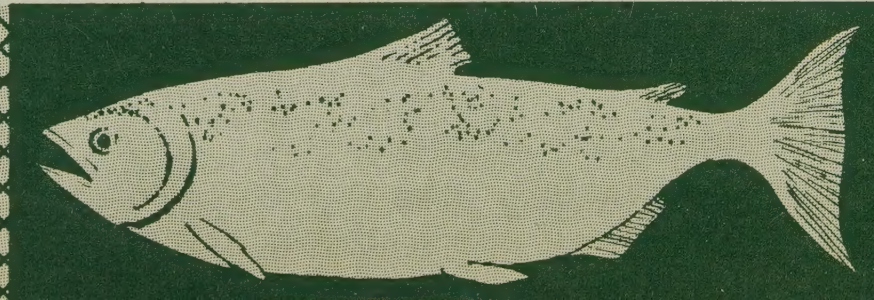
COMMERCIAL FISHERIES ABSTRACTS

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES



UNITED STATES DEPARTMENT OF THE INTERIOR
Walter J. Hickel, *Secretary*
Fred J. Russell, *Under Secretary*
Leslie L. Glasgow, *Assistant Secretary for Fish and Wildlife and Parks*

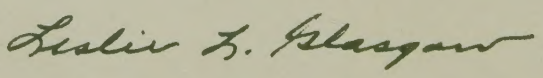
U.S. FISH AND WILDLIFE SERVICE
Charles H. Meacham, *Commissioner*

BUREAU OF COMMERCIAL FISHERIES
Philip M. Roedel, *Director*

FOREWORD

The Department of the Interior's Bureau of Commercial Fisheries publishes the monthly journal *Commercial Fisheries Abstracts* as one means of communicating to the fishing industry and allied groups the status of current fishery research. The research includes the biological aspects of fishery science as well as technological studies dealing with aquatic resource supply, harvesting, processing, utilization, and distribution.

Commercial Fisheries Abstracts contains summaries of selected articles from trade, engineering, and scientific journals dealing with the entire spectrum of fishery science. The publication is designed to serve the needs of fishery scientists, engineers, and managers in industry, academic institutions, and government by supplying timely information on current progress in fishery research and technology.



Leslie L. Glasgow
Assistant Secretary for Fish and
Wildlife and Parks

0.111 USE OF SOLDER GLASS BY UNSKILLED LABORATORY WORKERS

Roubal, William T. (Bureau of Commercial Fisheries, Seattle, Washington 98102)
Journal of Chemical Education 47, No. 2, 162-164 (February 1970)

Solder glasses are of two types: vitreous, which, like conventional glass, can be reworked repeatedly in the melted state; and devitrifying, or crystallizing, which, though a vitreous melt initially, on continued heating gradually becomes ceramiclike. Once devitrifying glass reaches the crystalline state, the seal it forms can be heated to a higher temperature than the temperature used for the initial cure. These types of glass take longer to cure than vitreous glasses take. Both types will give vacuum-tight seals.

Solder glasses are sold in powder form. They have melting ranges well below the materials they are used to seal or bond--some ceramics, many metals, certain crystals, and mica of the proper shape. A table is given specifying not only the material that 22 varieties of the glass will seal but the manufacturing source, the time and temperature required for sealing, and the linear expansion ranges. Seals can be formed by dipping the parts of the assembly into molten vitreous solder glass, quickly pressing them together, and then placing them in a muffle furnace to cure. Or the solder glass powder can be mixed with 1 percent nitrocellulose in amyl acetate to form a thick cream. The cream can be sprayed, brushed, or silk screened onto the parts to be joined, or the parts can be dipped into the cream. Once they are coated, the parts are clamped together and allowed to dry. Several applications of solder glass as a seal for borosilicate apparatus

(over)

 Abstracter: L. Baldwin

0.3 THE CHEMICAL BIOLOGY OF FISHES
(9.6)(8.0)

Love, R. Malcolm
Academic Press, 547 pp. (n.d.) 140s
Paul Dando (reviewer)
New Scientist 46, No. 695, 34 (April 2, 1970)

The first quarter of this book is a review of the chemical constituents of fish tissues, including an account of some of the sampling errors commonly made in the analysis of chemical compounds of fish, the difficulties generated by cell and tissue heterogeneity in fish muscle, and the nearly impossible task of sampling fish in a naturally rested or unstressed condition. Later sections deal with changes in the chemical components of fishes during their life cycle, including the major changes in tissues during maturity and spawning; differences in tissue constituents, including an account of intraspecific variation and of ecological effects on the behavior and composition of fish; and the effects of both natural and forced periods of starvation on fishes' chemical composition. The author emphasizes throughout the book that results obtained with one species do not necessarily apply to other species.

The second half of the book contains indexes of published material reporting work that has been done on the chemical components of fish. This material is listed under both the fish species and the chemical.

 Abstracter: L. Baldwin

0.118 A SOLID SAMPLE INJECTOR AND CAPILLARY EFFLUENT SPLITTER
(7.1) PROVIDING A COMPLETELY METAL-FREE GAS CHROMATOGRAPHIC SYSTEM

Meyer, Andre S. (Department of Biology, Case Western Reserve University, Cleveland, Ohio 44106)
Analytical Biochemistry 33, No. 2, 447-453 (February 1970)

In earlier studies of the insect juvenile hormone from the cecropia silk moth, the author suspected, at a certain stage of his work, that vapors of the two hormone molecules decomposed when reacting with hot metal surfaces. Some conversion of the molecules took place when the compounds were introduced into the gas chromatograph at 195° C. The author postulated that such decomposition of sensitive molecules could be avoided by use of a metal-free gas chromatographic unit. He developed a completely metal-free gas chromatographic system by fabricating those parts implicated in the decomposition process.

The report describes a simple metal-free, solid sample injector, a glass capillary effluent splitter, and its connection to the GLC (gas-liquid chromatography) glass column. The parts were designed to fit the column bath used by the author's laboratory (Barber-Colman Co., model 5660). The conventional U-shaped glass columns were employed with a minimum of alteration. The injector makes quantitative introduction of extremely small amounts of metal-sensitive compounds into a gas chromatograph possible and provides, for analytical purposes, a GLC system metal-free from injection to detection. Also, for micropreparative work, use of a glass capillary effluent splitter joined to the column

(over)

 Abstracter: F. T. Piskur

0.321 CIRCULAR DICHROISM AND ABSORPTION SPECTRA
OF HORSE RADISH PEROXIDASE AND SPERM WHALE MYOGLOBIN
IN THE SORET REGION

Willick, Gordon E., Gregory R. Schonbaum, and Cyril M. Kay (Department of Biochemistry, University of Alberta Medical School, Edmonton, Canada)
Biochemistry 8, No. 9, 3729-3734 (September 1969)

The structure and function of myoglobin and its derivatives have been studied extensively in recent years. The studies have included optical rotatory dispersion, circular dichroism, nuclear magnetic resonance, and crystallographic work, the latter in particular having led to an intricate knowledge of the immediate environment of the heme group. Such knowledge is essential to the interpretation of the functional diversity of hemoproteins. It is not available on horseradish peroxidase. But, since sperm whale myoglobin and horseradish peroxidase have the same type prosthetic group, ferriprotoporphyrin IX, the authors compared the parameters that reflect the group's interaction with its immediate environment. They found that the heme environment in the two proteins differs; on reduction from the ferri to the ferro form, the hemoprotein conformation of whale myoglobin shows no change whereas that of horseradish peroxidase changes in the immediate vicinity of the heme, resulting in gross change in the circular dichroism spectra.
[8 figures, 24 references]

 Abstracter: L. Baldwin

0.118

by a special Teflon connector provides a metal-free system through solute collection. Diagrams of the injector assembly and the metal-free connection of two glass sockets are included. [2 figures, 7 references]

0.321
(3.337) [EFFECT OF HEATING ON THE DISINTEGRATION OF PROTEINS IN THE MUSCLE TISSUE OF FISH]

Kamal' Abd El' Latif Khammadi (Astrakhanskii Tekhnologicheskii Inst. Rybnoi Promyshlennosti i Khozyyaistva, U.S.S.R.)
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya 1969, No. 3, 85-86 (1969)
Food Science and Technology Abstracts 2, No. 1, 125, Item 01R17 (January 1970)

Fish protein tissue was digested under pressure at ≤140° C., and the type and degree of protein breakdown were investigated. The accumulation of nonprotein nitrogen was taken as an indication of the extent of protein breakdown. When the temperature was ≤130° C., the increase in nonprotein nitrogen was constant, but at temperatures above 130° C., the increase was sharp. [2 references]
[Extracter: L. Baldwin]

0.37
(1.83) GLYCOSIDASES OF ABALONE HEPATOPANCREAS

Bennett, Richard, Jr., N. M. Thanassi, and H. I. Nakada (Univ. of California, Santa Barbara)
Chemical Abstracts 72, No. 9, 39198g (March 2, 1970)

0.112 AN EASILY CONSTRUCTED DUAL CHAMBER MICROCUVETTE FOR ULTRAVIOLET-VISIBLE SPECTROPHOTOMETRY OF AQUEOUS SOLUTIONS

Kadoum, A. M., and Charles C. Anderson (Department of Entomology, Kansas State University, Manhattan 66502)
Journal of Agricultural and Food Chemistry 18, No. 2, 322-323 (March-April 1970)

The authors designed and constructed an inexpensive but useful dual chamber microcuvette module. Slits were cut in a methacrylate block (Plexiglas) and quartz windows were glued to the block with epoxy glue. The module size and the location of the slits were designed to fit the specific spectrophotometer (Coleman Autoset) available in the authors' laboratory. The entire cell body is essentially the adapter. The authors obtained accurate readings in assays of enzymes, using visible and ultraviolet light with the dual chamber microcuvette and 200-µl. samples. The total cost of the module was less than $5.00.
[2 figures] [Abstracter: F. T. Piskur]

0.32 ALKALI SOLUBILIZATION OF CHICKEN FEATHER KERATIN

Nagai, Yasutoyo, and Tetsusaburo Nishikawa (Laboratory of Nippai Co., Ltd., 640 Higashiterao, Tsurumi, Yokohama, Japan)
Agricultural and Biological Chemistry 34, No. 1, 16-22 (January 1970)

This paper describes experiments on solubilizing chicken feather keratin and reports some properties of chicken feather keratin solubilized by alkali.
Several methods of solubilizing feather keratin were tried: heating for 24 hr. at 35° C. in 0.25 M sodium thioglycolate (pH 11.0) in 8 M urea containing 0.3 M sodium bisulfite (pH 6.0), in 0.1 M sodium sulfide; and in 0.1 M sodium hydroxide; and heating for 30 min. at 90° C. in 0.2 M sodium carbonate and 0.1 M sodium hydroxide. The hot sodium hydroxide treatment was the most effective in solubilizing the chicken feather keratin.
Chicken feather keratin solubilized by heating at 90° C. for 15 min. in 0.1 M NaOH produced about equal amounts of a water-soluble protein fraction and a dialyzable amino-acid fraction. The soluble protein fraction was richer in methionine, lysine, and glutamic acid and poorer in threonine, serine, cystine, and arginine than the original feather keratin. The authors also stated that the results obtained by column chromatography with the dialyzable amino acids were not consistent with those obtained with standard amino acids, suggesting that the amino acids from the keratin had been altered during the solubilizing process.
[7 figures, 2 tables, 18 references] [Abstracter: F. T. Piskur]

0.111

to be used in wet chemistry are described, and the technique of fabrication is detailed.
Although no solder glass is as durable as ordinary glass, 5 of the tabulated glasses will stand up under normal immersion in water and the remaining 17 will resist the action of organic solvents. Because of their novel properties and their simpler demands on the skills of the fabricator, researchers no longer need use less satisfactory substitutes for the piece of apparatus they want.
[2 figures, 1 table, 6 references]

0.12
(3.5) [DEVICE FOR PACKING FISH IN BARRELS DURING SALTING]

Terent'ev, A. V., A. M. Butikov, and N. I. Oyagilev (pat.)
U.S.S.R. Patent 239,786 (1969)
Food Science and Technology Abstracts 2, No. 1, 27, Item 01F12 (January 1970)

The method described makes possible the mechanized packing of such large salted fish as cod and bass. A roller platform is fixed on a vertical shaft in such a manner that it can swing back and forth (up to 7 degrees) on a vertical axis that passes through the center of the barrel in which the fish are being packed. A crank gear connects an eccentric to the roller platform.
[Extracter: L. Baldwin]

0.35 UBISEMIQUINONE IN MEMBRANES FROM ESCHERICHIA COLI

Hamilton, J. A., G. B. Cox (Department of Biochemistry, John Curtin School of Medical Research, Australian National University, Canberra, A.C.T. 2061, Australia), F. D. Looney, and F. Gibson (Division of Applied Chemistry, Commonwealth Scientific and Industrial Research Organization, Chemical Research Laboratories, Melbourne, Vic. 3207)
Biochemical Journal 116, No. 2, 319-320 (January 1970)

The electron spin resonance (ESR) spectra of respiratory membranes from mitochondria show an asymmetric signal with the major component in the region of g = 1.9, a signal that has been attributed to "nonhaem iron" (Sands and Beinert, 1960; and Beinert and Palmer, 1965). Also, a symmetrical signal due to an organic radical ($g \simeq 2.00$) has been found in respiratory membranes (Sands and Beinert, 1960), but has not been definitely assigned owing to the lack of hyperfine structure. The semiquinones of flavin and ubiquinone may be the sources of the signal (due to an organic radical).

The authors found that the ERS spectrum of membranes from Escherichia coli K12, strain AN62, consists of a symmetrical signal with $g = 2.003 \pm 0.001$ and with a peak-to-peak width of 12G. Apparently, the g value, symmetry, peak-to-peak width and the saturation of the signal at relatively low power levels are consistent with those occurring when an organic free radical of the semiquinone type is the source of the signal.

(over)

 Abstracter: F. T. Piskur

0.6 (9.2) BUILDING A TECHNOLOGY INTO A BUSINESS

Hase, Paul F., and Charles B. Riter (The New Enterprises Div., The Pillsbury Co., Minneapolis, Minnesota)
Food Product Development 4, No. 2, 16, 18-19, 64 (April 1970)

In this article, the authors describe the market development of a product (Space Food Sticks) already built from technology. They contend that if a consumer need for a product built from technology cannot be tapped, then the technology should be shelved. If the technology is not shelved, the chances are good that the product marketed without real consumer benefits will fail.

Space Food Sticks were developed in response to a need for a complete meal in stick form to be eaten by our astronauts under the strenuous conditions of manned space flight. A product having the required characteristics was developed. These characteristics were to provide instant energy, provide lasting energy, be nutritionally balanced, be good tasting, be portable, and not produce crumbs. For the first time, a product was developed that was in a convenient form, was good tasting, and contained complete proteins, carbohydrates, and fats in the proportion necessary to sustain life for an indefinite period.

Having developed the technology for a specialized product, the next consideration was the possible outlet for products for the general consumer based on the new technology. This decision was based not just on the availability of the technology but also on previously obtained market research data. These marketing studies had been undertaken to evaluate the ever-changing eating habits of American families and the evolution of the roles played by household members in those patterns.

(over)

 Abstracter: F. T. Piskur

0.38 (6.54) PLASTEIN REACTION. ITS APPLICATION TO DEBITTERING OF PROTEOLYZATES

Fujimaki, Masao, Michiko Yamashita, Soichi Arai, and Hiromichi Kato (Department of Agricultural Chemistry, University of Tokyo, Tokyo, Japan)
Agricultural and Biological Chemistry 34, No. 3, 483-484 (March 1970)

A plastein is an insoluble polypeptide of high molecular weight formed through the condensation of amino acids or peptides (or partially hydrolyzed protein) under the catalytic influence of certain proteolytic enzymes, such as chymotrypsin. Proteolyzates obtained by treating proteins with proteolytic enzymes, especially pepsin, have a bitter taste due to the presence of bitter peptides. Previous workers tried to remove the bitter flavor from certain proteolyzates by use of leucine aminopeptidase and carboxypeptidases. The use of exopeptidases has limited value because such enzymes produce free amino acids that may adversely affect the nutritional value of the product.

The present authors suggest that the bitterness of proteolyzates can be eliminated by reconstituting [condensing] the bitter proteolyzates by means of the plastein reaction. They found that the bitterness of a partial hydrolyzate of soy protein could be removed by the plastein reaction using chymotrypsin as the catalyst. They also tested other enzymes for their ability to produce nonbitter plasteins from the peptic hydrolyzate of soy protein as follows: trypsin and pepsin (animal proteinases); papain and bromelin (plant proteinases); carboxypeptidase A, aspergillus acid carboxypeptidase, and leucine aminopeptidase (exopeptidases); and Bioprase, Coronase, Molsin, Pronase, Prozyme, Rapidase, Takadiastase,

(over)

 Abstracter: F. T. Piskur

0.6 (9.6) INDUSTRIAL FISHERY TECHNOLOGY

Stansby, Maurice E. (ed.)
International Marine Publishing Company, 403 pp. (n.d.) $12.75
National Fisherman, 9S (May 1970)

This survey of methods for harvesting, preserving, and processing fish for use as food or as the source of raw material for industrial products was written by 26 experts in the field. The 29 chapters are divided into 5 parts: fishes and fishery methods, description of important fisheries and their products, fishery industrial products, preservation methods, and food science applications. The second of these parts covers the following fisheries: bottom fish, tuna, salmon, halibut, sardine, mackerel, herring, menhaden, shrimp, oyster, clam, scallop, abalone, crab, lobster, and marine mammal.

The book is illustrated; it has an index and a very full bibliography.

 Abstracter: L. Baldwin

0.6 DEVELOPMENT OF CHEMICAL RESEARCH ON ARTIFICIAL AND SYNTHETIC FOOD

Joint Publications Research Service, Washington, D.C.
Belikov, V. M., S. V. Rogozhin, G. L. Slonimskii, V. Golovnya, and B. V. Tolstoguzov
Translation of Uspekhi Khimii (USSR) 38, No. 9, 1569-1596 (1969)
Available from the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Va. 22151, order No. JPRS-49554. Price $3.00.

This article is a review of development work on the microbiological synthesis of synthetic food. The following areas and their relation to synthetic foods are discussed: proteins and nutrition; amino acids from yeasts and direct synthesis; odor and taste; and the shape and texture of synthetic food.

[Abstracter: F. T. Piskur]

0.5 CULTIVATION OF RODENT TYPHOID BACTERIA ON FISH HYDROLYSATES

Malushko, L. V.
Trans. of Veterinariya (USSR) 42, No. 2, 111-113 (1966)
Available from the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia 22151. Order No. AD-848 996. Price $3.00.

Media prepared from fish hydrolysates may be used for the cultivation of mother cultures of rodent typhoid bacteria. The media contains 90-120 mg.percent amino nitrogen and 0.4-0.5 percent sodium chloride. Prolonged storage of the concentrated fish hydrolysates at room temperature did not affect their characteristics over a period of 1½ years. [Abstracter: F. T. Piskur]

0.4 AMINO ACID SEQUENCE OF SALMON ULTIMOBRANCHIAL CALCITONIN (8.51)

Niall, H. D., H. T. Keutmann, D. H. Copp, and J. T. Potts, Jr. (Massachusetts General Hospital, Boston, Mass., and University of British Columbia, Vancouver, British Columbia)
Proceedings of the National Academy of Science of the U.S.A. 64, No. 2, 771-778 (October 1969)

Salmon ultimobranchial calcitonin was isolated, purified, and analyzed for its amino-acid sequence by both manual Edman degradation and automated degradation. The results showed that the salmon molecule, like other calcitonins, has a 32-amino-acid peptide chain that terminates in prolinamide and contains half-cystine residues at positions 1 and 7. Although the sequence of the salmon hormone differs markedly from that of porcine, bovine, and human calcitonins, all four of these hormones are homologous in 9 of the 32 positions. Because of the much higher potency of its hypocalcemic activity, the salmon molecule is of particular value for structure function studies.

[2 figures, 1 table, 29 references] [Abstracter: L. Baldwin]

0.38 ALGINATE LYASES OF PSEUDOMONADS

Kashiwabara, Yoshiko, Hiroshi Suzuki, and Kazutosi Nisizawa (Tokyo Kyoiku Univ., Tokyo, Japan)
Chemical Abstracts 72, No. 5, 18615a (February 2, 1970)

0.35

Further observations seemed to indicate that the organic radical found in strain AN62 may be due to the semiquinone form of flavin, vitamin K, or ubiquinone. Therefore, the authors examined membrane preparations from strain AN59 of E. coli K12, which is unable to form ubiquinone. The free-radical could not be detected in membrane preparations of strain AN59, but on the addition of ubiquinone the free-radical signal was observed--it showed a lower intensity than that shown by membranes from strain AN62. Further incubation of membranes of AN59 (containing added ubiquinone) at 0° C. for 24 hr. removed the radical signal, which signal was replaced by the signal attributed to nonheme iron. When substrate was added, the spectral changes were accelerated. The nonheme-iron signal was also observed in the membranes from strain AN59 in the absence of added ubiquinone, either on prolonged incubation or after the addition of substrate.

The authors, therefore, suggest that the organic radical observed in respiratory membranes of E. coli is probably due to the presence of ubisemiquinone. But, because of the lack of hyperfine structure in the signal, another radical derived from ubiquinone, (for example, the chromanoxyl radical) is possible.

[1 figure, 6 references]

0.6

Findings of the family survey were: (1) the traditional family three-meal-a-day is fading, (2) more and more people obtain a large part of their daily food intake by in-between meal snacking, (3) the snack foods are usually high in fat and carbohydrates and low in protein, (4) the meal preparation is shifting from the mother/wife to the individual family member, (5) time spent consuming food at the table is decreasing, and (6) item/portion control is being assumed by the individual family member.

Studies by other researchers revealed that many Americans, even those who have the necessary means, are undernourished.

On the basis of the two studies, the authors' firm felt that the space food product could fill consumer needs. The firm, then, decided to commercialize the product. The rest of the article describes how the product was introduced into the general consumer market. [3 figures, 3 tables]

0.5 GAS CHROMATOGRAPHY FOR DETECTION & CHARACTERIZATION OF MICROORGANISMS

Alexander, M. (Department of Agronomy, Cornell University, Ithaca, New York 14850)
Food Technology 24, No. 4, 68, 70, 72 (April 1970)

The author suggests that highly sensitive gas chromatographic techniques can be used to detect and characterize bacteria. By means of such techniques, one type of bacterial population in a collection of different types can be recognized even when fewer organisms are present than could be detected by conventional means. The technique has the advantage of cutting down the time required for the detection and identification of bacteria.

[1 figure, 3 tables, 10 references] [Abstracter: F. T. Piskur]

0.38

and Thermoase (commercial preparations). Only Biopräse and Prozyme were found to be highly productive of plastein and to be effective in removing the bitter flavor of the soy protein hydrolyzate. The bitterness was measured by a phenylthiourea comparison method (Arai et al., in press). [12 references]

0.6 PROPER CHOICE OF SURFACTANTS -- PART II. FUNCTION AND APPLICATION

Thalheimer, W. G., and D. T. Rusch (Atlas Chemical Industries, Inc., Wilmington, Delaware)
Food Product Development 4, No. 2, 70, 74, 76, 78, 86 (April 1970)

Although the selection of the right surfactant for complex food systems is difficult, the HLB (hydrophile-lipophile balance) system of classification described in part I of this series is of some help. The best approach in selecting a surfactant is to first define the role that the surface active agent is to perform. This information, then, will serve as a base for the proper selection of the surfactant.

Surfactants generally serve five functions in foods: dispersing, complexing, crystallization control, wetting, and lubricating. The article describes the five roles of surfactants in foods and gives examples of foods and appropriate surfactants used to perform these various roles. [7 figures]

 Abstracter: F. T. Piskur

0.7 PERIODICAL CHANGE IN THE CARCASS COMPOSITION OF CHICKS (4.90)(6.193) AFTER SWITCHING OVER THE DIET TO LIPOGENIC OR LIPOLYTIC DIET

Yoshida, Minoru, and Hiroshi Morimoto (National Institute of Animal Industry, Chiba-shi, Japan)
Agricultural and Biological Chemistry 34, No. 3, 423-431 (March 1970)

The authors determined the change in composition of the carcass of young chicks at various age periods when the diets of the chicks were switched from a "lipogenic" diet to a "lipolytic" diet and vice versa. The authors define a lipogenic diet as one low in protein and high in energy that produces chicks of high fat content (or makes them fatty). They define lipolytic diet as one high in protein and low in energy that produces chicks of low fat content (or makes them lean).

The authors report that the fat content of the chicks (as determined from carcass analysis) changes rapidly and fluctuates as the diets are switched. When the lipogenic diet replaces the lipolytic diet of the chicks, the carcass fat increases gradually and reaches an apparent equilibrium after 12 days with fiducial limits from 17 to 19 days. When the lypolytic diet replaces the lipogenic diet, the carcass fat of the chicks decreases and reaches an apparent equilibrium after 7 days. The lipogenic or lipolytic effect of the diets is apparently not related to the simple change in supply of dietary energy supplied to the chicks but is, rather, governed by the level of dietary energy relative to the protein level. [6 figures, 2 tables, 3 references]

 Abstracter: F. T. Piskur

0.7 DIETARY ALLOWANCES--AN INTERNATIONAL POINT OF VIEW

Patwardhan, Vinayak N. (Vanderbilt University, School of Medicine, Nashville, Tennessee)
Journal of the American Dietetic Association 56, No. 3, 191-194 (March 1970)

The author illustrates by three examples some differences between national and international recommendations for dietary allowances for man, and he discusses the probable reasons for these differences. The three examples are shown in the following tables.

Origin of the recommendation	Date of recommendation	Recommended dietary allowance[1] for protein for young adult males		
		Body weight	Protein allowance	Comments
		kg.	g./day	
United States	1968	70	65	Efficiency of utilization of dietary protein--70 percent
Canada	1964	65	55	Chemical score--79 percent
United Kingdom	1969	65	68	N.P.U.--70 percent
FAO/WHO	1965	65	66	N.P.U.--70 percent

1/ Allowance, here, considered synonymous with intake.

(over)

 Abstracter: F. T. Piskur

0.7 THE CANADIAN DIETARY STANDARD

Sabry, Z. I. (Department of Nutrition, School of Hygiene, University of Toronto, Toronto, Ontario, Canada)
Journal of the American Dietetic Association 56, No. 3, 195-199 (March 1970)

The paper presents recommended daily nutrient intakes proposed to be adequate for the maintenance of health of the majority of Canadians. The values are intended as a guide in planning diets and food supplies. The data are summarized in the following table:

Classification of groups					Recommended daily nutrient intake for Canadians			
Group number	Sex	Age	Weight	Activity category[1]	Calories[1]	Protein[2]	Calcium	Iron
		years	pounds			grams	grams	mg.
1	M & F	0-1	7-20	usual	360-900	7-13	0.5	5
2	M & F	1-2	20-26	usual	900-1,200	12-16	0.5	5
3	M & F	2-3	31	usual	1,400	17	0.7	5
4	M & F	4-6	40	usual	1,700	20	0.7	5
5	M & F	7-9	57	usual	2,100	24	1.0	5
6	M & F	10-12	77	usual	2,500	30	1.2	12
7	M	13-15	108	usual	3,100	40	1.2	12
8	F	13-15	108	usual	2,600	39	1.2	12
9	M	16-17	136	B[3]	3,700	45	1.2	12
10	F	16-17	120	A[4]	2,400	41	1.2	12
11	M	18-19	144	B[3]	3,800	47	0.9	6
12	F	18-19	124	A[4]	2,450	41	0.9	10
13	M	adult	154	B[3]	3,582	47	0.5	6
14	F	adult	124	A[4]	2,390	40	0.5	10

1/ The recommendation for caloric intake for adults was based on an energy allowance for maintenance plus an allowance for activity.
2/ Based on mixed diet--higher protein contents may be required in vegetarian diets.
3/ Expenditure assessed as being 113 percent of that of a man of same weight and engaged in same degree of activity.
4/ Expenditure assessed as being 104 percent of that of a woman of same weight and engaged in same degree of activity.

 Abstracter: F. T. Piskur

0.7 SPECIAL COTTONSEED PRODUCTS REPORT

Feedstuffs 42, No. 16, 19 ff. (April 18, 1970)

This issue of the journal features a special report on cottonseed products for livestock. The four articles constituting the report deal with the nutrient composition of cottonseed meal and the use of cottonseed meal in the rations of young chickens, commercial laying hens, and swine. The articles are:

"Nutrient Composition of Cottonseed Meal," by Keith J. Smith (National Cottonseed Products Assn. Inc., Memphis, Tennessee) pp. 19-20 [4 tables];

"Use of Cottonseed Meal in Diets for Commercial Egg Production," by P. W. Waldroup, T. O. Goodner, and D. R. Sloan (University of Arkansas, Fayetteville), pp. 20-22 [6 tables, 19 references];

"Use of Cottonseed Meal in Swine Rations," by T. D. Tanksley, Jr. (Animal Science Department, Texas A & M University, College Station, Texas), pp. 22, 24 [2 tables, 20 references];

"Use of Cottonseed Meal in Rations for Young Chickens," by A. B. Watts (Department of Poultry Science, Louisiana State University, Baton Rouge), pp. 24, 50-51 [4 tables, 4 references].

[Abstracter: F. T. Piskur]

0.7

Table--Continued

Classification of groups[1] number	Recommended daily nutrient intake for Canadians: Vitamin A	Vitamin D	Ascorbic acid	Thiamin	Riboflavin	Niacin
	I.U.	I.U.	mg.	mg.	mg.	mg.
1	1,000	400	20	0.3	0.5	3
2	1,000	400	20	0.4	0.6	4
3	1,000	400	20	0.4	0.7	4
4	1,000	400	20	0.5	0.9	5
5	1,500	400	30	0.7	1.1	7
6	2,000	400	30	0.8	1.3	8
7	2,700	400	30	0.9	1.6	9
8	2,700	400	30	0.8	1.3	8
9	3,200	400	30	1.1	1.9	11
10	3,200	400	30	0.7	1.2	7
11	3,200	400	30	1.1	1.9	11
12	3,200	400	30	0.7	1.2	7
13	3,700	--	30	1.1	1.8	11
14	3,700	--	30	0.7	1.2	7

[1] See first part of the table on front of card for a description of the groups.

[5 figures, 2 tables, 5 references]

0.6 CENTRAL OREGON COAST. VOLUME V.
(1.0113) COMMERCIAL FISHING AND FISH PROCESSING

University of Oregon, Bureau of Government Research and Service, Eugene, Oregon. Available from the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Va. 22151. 42 pp. (1969). Price $3.00.

This report is an analysis of the commercial fisheries of a four-county coastal area of Oregon. [Abstracter: F. T. Piskur]

The publication is part of the Proceedings of the Symposium on the Living Resources of the African Atlantic Continental Shelf between the Straits of Gibraltar and Cape Verde, organized by ICES [International Council for the Exploration of the Sea] with the support of FAO [Food and Agriculture Organization of the United Nations], and held in Santa Cruz de Tenerife on 25-28 March 1968. The present volume, issued by FAO, containing the general report and abstracts of [80] papers presented at the Symposium was prepared and edited by the Marine Biology and Environment Branch, Department of Fisheries, Rome. The full text of the contributed papers selected to be printed will be published by ICES in due course, in Rapports et Procès-Verbaux des Reunions volume 159. [Reprinted in part]

1.0161 PROCEEDINGS OF THE SYMPOSIUM ON THE LIVING RESOURCES
(9.6) OF THE AFRICAN ATLANTIC CONTINENTAL SHELF BETWEEN
THE STRAITS OF GIBRALTAR AND CAPE VERDE

Anonymous
FAO Fisheries Reports, No. 68, iii + 74 pp. (September 1969)

0.7

Origin of the recommendation	Date of recommendation	Recommended dietary[1] allowance for calcium and vitamin A for young adult males: Calcium allowance	Vitamin A: Daily allowance	Comments
		mg./day		
United States	1968	800	5,000 I.U.	About 50% as preformed vitamin
Canada	1964	500	3,700 I.U.	About 50% as preformed vitamin
United Kingdom	1969	500	750 mcg.	As retinol equivalent
FAO/WHO	1962, 1967	400-500	750 mcg.	As retinol

[1] Allowance, here, considered synonymous with intake.

[2 tables, 10 references]

This new journal publishes articles dealing with the methodology and practice of technological forecasting as a planning tool, including the interrelation of social, environmental, and physical factors affecting such forecasts. Vol. 1, No. 1, June 1969, and Vol. 1, No. 2, Fall 1969, have been issued.

[Abstracter: F. T. Piskur]

0.9 TECHNOLOGICAL FORECASTING
(7.1) (9.6)

Anonymous
Published by the American Elsevier Publishing Co., Inc., 52 Vanderbilt Avenue, New York, N.Y. 10017. Subscription price $22.00, plus $2.00 postage, for one volume.

0.7 (6.190) BROILERS: AMINO ACID REQUIREMENTS

Anonymous
Feedstuffs 42, No. 16, 52 (April 18, 1970)

This article summarizes a report given by Gerald F. Combs (University of Maryland) at the Maryland Nutrition Conference held in Washington, D.C. The level of amino acids to be provided is related to the energy content of the feed. This relation is expressed in the following table.

Item	Recommended amino acid energy ratios[1] and desirable Ca/P values for rations of broilers for age periods of:		
	0-4 weeks	5-8 weeks	After 8 weeks
Amino acid			
Methionine	0.33	0.31	0.25
Methionine + Cystine	0.62	0.55	0.47
Lysine	0.81	0.72	0.62
Tryptophane	0.16	0.14	0.12
Threonine	0.56	0.49	0.42
Arginine	0.88	0.77	0.66
Glycine	0.70	0.60	0.50
Phenylalanine	0.56	0.49	0.42
Phenylalanine + Tyrosine	1.04	0.92	0.78
Valine	0.68	0.60	0.51
Isoleucine	0.60	0.53	0.45
Leucine	1.12	0.99	0.84
Histidine	0.32	0.28	0.24
Mineral			
Desirable Ca/P ratio	60-63	67-70	72-75

[1] Percent of amino acid per megacalorie of metabolizable energy per pound of diet. These ratios apply to moderate temperature conditions. They should be increased by 5 to 10 percent during hot summer weather.

(over)

 Abstracter: F. T. Piskur

0.8 (6.135) STUDIES ON THE PREVENTION OF OFFENSIVE ODOUR FROM FISH PROCESSING PLANTS. III. DIFFUSION OF THE ODOROUS GAS IN AIR AND EFFECTIVE HEIGHT OF AN EXHAUST STACK

Motohiro, Terushige (Laboratory of Marine Food Technology, Faculty of Fisheries, Hokkaido University), and Hitoshi Terachi (Research Laboratory of Kanesa Miso Co. Ltd.)
Bulletin of the Faculty of Fisheries Hokkaido University 20, No. 3, 235-241 (November 1969) (In Japanese; figures, tables, and summary in English)

A study was made to determine the relation between the chemical composition of odorous gases emitted from a fish-processing firm and the intensity of the odor at places various distances from the firm. The gases were found to consist of ammonia, trimethylamine, hydrogen sulfide, and indol. Odorous compounds that were emitted in small amounts disappeared and the intensity of the others decreased as the distance from the firm increased.

From the data obtained during the study, the authors were able to calculate the regular distribution of a given concentration of odorous gases. They used the following equation:

$$C = 2.8 \times 10^{-3} F_1 (h/H)/UX\theta h$$

in which C is the concentration of the gases (mg./m.^{3}), h is the height at which the gases are diffused (m.), H is the effective height of the stack (m.), U is the average wind velocity (m./sec.), X is the distance downwind of the affected site from the fish-processing plant (km.), θ is the angle at which the gases are diffused (deg.) and F_1 is a gas-height factor.

(over)

 Abstracter: L. Baldwin

0.7 (6.193) INTERRELATIONSHIP BETWEEN DIETARY PROTEIN LEVEL AND CARCASS COMPOSITION OF CHICKS

Yoshida, Minoru, and Hiroshi Morimoto (National Institute of Animal Industry, Chiba-shi, Japan)
Agricultural and Biological Chemistry 34, No. 3, 414-422 (March 1970)

The carcass fat content of chicks can be shifted by changing the dietary composition, particularly dietary energy and protein levels. Carcass fat content of chicks decreases as dietary protein increases and levels off with an upper level of dietary protein. Also, the fat content of chicks decreases as dietary energy decreases and levels off with a lower level of dietary energy. The simultaneous change of dietary protein and energy is more effective than individual changes of each component.

The objective of this study was to find the upper and lower limits in the composition of the carcass of chicks by shifting the dietary level of the growing chicks and to obtain data that will help clarify the interrelation between the composition of the diet and the composition of the carcass of the chicks.

Experimental diets of protein levels ranging from 9 to 79 percent (dry basis) were fed to chicks. Under the test conditions, the fat content (y) of the chick carcasses decreased exponentially with the increase in level of dietary protein (x) in accordance with the following equation:

$$y = 1096\, x^{-1.552}$$

(over)

 Abstracter: F. T. Piskur

1.86 (1.0115) CHANGES IN ABUNDANCE OF THE GREEN CRAB, CARCINUS MAENAS (L.), IN RELATION TO RECENT TEMPERATURE CHANGES

Welch, Walter R. (Bureau of Commercial Fisheries, Biological Laboratory, West Boothbay Harbor, Maine 04575)
Fishery Bulletin 67, No. 2, 337-345 (June 1969)

Trap catches, shore surveys, and fishermen's reports demonstrated that declining abundance of green crabs in northern New England was associated with particularly cold winters and a cooling trend in the water. Since the mid-1950's, the once great abundance of green crabs in northeastern Maine has declined to a scarcity or total absence. Abundance in southwestern Maine and in Massachusetts has fluctuated widely, and moderate abundance in Rhode Island decreased consistently through 1959.

Mass mortalities of green crabs in winter coincided with periods of severe cold. The general abundance and commercial catch of the soft-shell clam (Mya arenaria), a common prey of the green crab, increased markedly during the period of decline of the crabs.

Although the decrease in abundance of green crabs is clearly associated with lower temperatures, the relation is not necessarily direct; there are a number of ways in which low temperature, in combination with lowered salinity, low dissolved oxygen, and other unidentified factors, may affect abundance.
[5 figures, 17 references]

 Authors' abstract

0.7

At the same time, the protein content of the carcass increased at a linear rate and reached a maximum level at 20.6 percent when the chicks were fed a dietary level of 31 percent or more of protein. The carcass components other than moisture, protein, and fat remained fairly constant, averaging 3.6 percent, regardless of the variation in diet. The authors postulated that the physiological upper and lower limits of fat content of the carcass is 17 percent and not less than 0.9 percent. [2 figures, 3 tables, 16 references]

0.9 TECHNOLOGICAL FORECASTING AND LONG-RANGE PLANNING
(7.1)(9.6)

Ayres, Robert U.
McGraw-Hill Book Co., New York, N.Y. (1969), 237 pp. Price $12.50
Harold A. Linstone (reviewer)
Technological Forecasting 1, No. 2, 227-228 (Fall 1969)

The reviewer states that this is a very readable book and should be welcomed by those who seek an elegant introduction to today's techniques for technological forecasting. [Abstracter: F. T. Piskur]

1.0118 A BRIEF HISTORY OF COMMERCIAL FISHING IN LAKE ERIE

Applegate, Vernon C., and Harry D. Van Meter (Bureau of Commercial Fisheries Biological Station, Sandusky, Ohio 44870)
U.S. Fish and Wildlife Service, Fishery Leaflet 630, 28 pp. (April 1970)

Salient features of the development of the industry from about 1815 to 1968, changes in fishing gears and methods, changes in the kinds and abundance of fishes caught, and the attendant effects of disappearing species on the stability of the fishery are described. The history and present status of the walleye, yellow perch, and eight other fishes, still taken in commercial quantities, are presented in more detail and are considered in the context of their effect on the current moribund state of the U.S. fishery. Past and present contributions of Lake Erie's tributaries and northerly connecting waters to the fishery are outlined briefly. The "outlook" for the fishery under present conditions of selective overfishing for high-value species, excessive pollution, ineffective and uncoordinated regulation, and antiquated methods of handling, processing, and marketing fish are discussed, and possible solutions to these problems are suggested.
[8 figures, 16 photographs, 1 table, 31 references] [Authors' abstract]

0.7

Because feed consumption by poultry is influenced by ambient temperature, the amino-acid levels in the feed should be adjusted accordingly. The following table indicates the requirements of broilers as adjusted for ambient temperature.

Nutrient	Amino acid, calcium, and available phosphorus requirement of broiler chickens (Maryland) (in percent per megacalorie metabolizable energy per lb.[1]) by age group (weeks) and ambient temperature (deg. F.)									
	0-3 weeks	4-5 weeks		6-7 weeks			8 weeks and longer			
	90° F.	80° F.	90° F.	70° F.	80° F.	90° F.	60° F.	70° F.	80° F.	90° F.
Amino acid[2]										
MET	0.34	0.33	0.34	0.31	0.32	0.33	0.26	0.27	0.28	0.29
TSAA[3]	0.62	0.59	0.61	0.55	0.57	0.58	0.47	0.49	0.50	0.52
LYS	0.82	0.79	0.80	0.72	0.75	0.76	0.62	0.64	0.66	0.68
TRY	0.16	0.15	0.16	0.14	0.15	0.15	0.13	0.13	0.13	0.14
THR	0.56	0.53	0.55	0.49	0.51	0.52	0.42	0.44	0.45	0.46
ARG	0.88	0.83	0.86	0.77	0.80	0.82	0.66	0.68	0.70	0.72
GLY	0.70	0.65	0.67	0.60	0.62	0.64	0.50	0.52	0.53	0.55
PHE	0.56	0.53	0.55	0.49	0.51	0.54	0.42	0.44	0.45	0.46
PHE + TY	1.04	0.98	1.02	0.92	0.95	0.98	0.78	0.81	0.83	0.85
VAL	0.68	0.64	0.66	0.60	0.62	0.64	0.51	0.53	0.54	0.56
ISO	0.60	0.57	0.59	0.53	0.55	0.58	0.45	0.47	0.48	0.49
LEU	1.12	1.06	1.09	0.99	1.02	1.05	0.84	0.87	0.89	0.91
HIS	0.32	0.30	0.31	0.28	0.29	0.30	0.24	0.25	0.25	0.26
Mineral										
Phosphorus	0.325	0.315	0.31	0.305	0.315	0.325	0.29	0.30	0.31	0.32
Calcium	0.65	0.63	0.62	0.61	0.63	0.65	0.58	0.60	0.615	0.63

1/ For actual percent in diet, multiply by metabolizable megacalories per pound.
2/ For name of amino acid corresponding to abbreviation see preceeding table.
3/ Total sulfur amino acids.

0.8

From this equation, the authors determined that, in view of local meteorological conditions, the effective height of the stack under study should be more than 20 m. [2 figures, 5 tables, 6 references]

0.8 WASTE DISPOSAL IN THE MEAT INDUSTRY/1
(6.0)(9.19)

Steffen, A. J. (Ralph B. Carter Co., Hackensack, New Jersey)
Water and Wastes Engineering 7, No. 3, B20-B22 (March 1970)

This is part 1 of a two-part article on the disposal of waste waters from the meat industry. It reviews the development of treatment methods such as chemical, conventional activated sludge, and irrigation. The report also discusses procedures for conservation and byproduct recovery, and compares the equipment and costs of three systems--trickling filters, anaerobic contact, and anaerobic-aerobic lagoons. (Aerobic and anaerobic pond systems will be discussed in part 2.)
[2 figures, 2 tables, 12 references] [Abstracter: F. T. Piskur]

1.12 (9.2) THE FUTURE ROLE OF INVESTMENT AND TECHNOLOGICAL CHANGE IN THE WORLD TUNA FISHERIES

Bell, Frederick W. (Division of Economic Research, Bureau of Commercial Fisheries, U.S. Department of the Interior, Washington, D.C. 20240)
International Conference on Investment in Fisheries, Rome, 18-24 September 1969
The Future Role of Investment and Technological Change in the World Tuna Fisheries, 26 pp. (1969) FE:IFI/69/Bp/44, FAO, Rome, Italy

On the basis of population and standard of living (i.e., per capita income) projections over the next 20 years and assuming that prices throughout the projection periods remain at 1966 levels, world tuna consumption is estimated to rise from 1,320,000 mt in 1966 to approximately 5,000,000 mt in 1990. The maximum sustainable yield for all the tuna fisheries in the world is estimated at no more than 2,600,000 mt.

Assuming a world price elasticity of unity for tuna, and that all of the presently harvested stocks of tuna are, at least to some extent, over-exploited, it is estimated that, by 1990, world tuna demand and supply will come into equilibrium at an ex-vessel price of 38 cents per pound and consumption of 2,100,000 mt, under existing technology of harvesting the resources. The flow of investment and, therefore, additional capacity into world tuna fisheries will create a management problem for these resources. By the year 2000, all tuna resources must be controlled at maximum sustainable yield, including the at present relatively underexploited skipjack.

(over)

 Author's abstract

2.1129 (2.144)(1.89) SQUID SLURP IS TESTED SUCCESSFULLY

Anonymous
Commercial Fisheries Review 32, No. 4, 5 (April 1970)

The Squid Slurp, a new pumping system, promises to eliminate much of the hard work in the...squid fishery....The traditional way to fish squid...is to anchor the vessel and turn on attracting lights at dusk. Brailing begins when enough squid gather under the lights. Usually, one fisherman holds on to the handle and purse line of the brail, while second pulls the brail through the concentration of squid. A third man operates a winch, which lifts the brail out of the water, and dumps the squid into the ship's hold.

With the Squid Slurp, the lighting arrangement remains unchanged, but the basic fishing unit is a pump with an 8-inch-diameter inlet that sucks in water at the rate of 1,600 gallons per minute to the pump inlet. A flanged elbow and 10-foot section of steel tubing is attached to a funnel with an opening measuring 3 feet by 1½ feet. Inside this funnel is placed a waterproofed light, and the entire unit is submerged. An 8-inch fish hose carries the squid to a dewatering screen on board, which leads to either of two fish holds by means of an adjustable chute.

On the night of February 25, squid rose abundantly under the lights. The pump...was started at 8 p.m. The squid were pumped slowly and steadily into the well but, during one 15-minute period when they swam directly toward the funnel, about 10 tons were taken aboard. After 4 to 5 hours of pumping, 61,350 pounds of squid were taken aboard.

(over)

 Reprinted in part

2.05 (9.6)(0.6) FUNGAL TOXIN

Dutton, M. F. (reviewer)
Aflatoxin--Scientific Background, Control and Implications (Food Science and Technology: A Series of Monographs), xii + 472 pp.
Leo A. Goldblatt (ed.)
Academic Press, New York and London (October 1969). 201s
Nature 225, No. 5238, 1171 (March 21, 1970)

In 1960, a large-scale outbreak of mycotoxicosis among turkey poults was traced to the presence of a group of mycotoxins in a groundnut-based feed contaminated with Aspergillus flavus. The name given to these pathogenic agents was "aflatoxin." In addition to being toxic, aflatoxins were shown to be highly carcinogenic to many animals, including man. Since this discovery, a great amount of work has been done in solving the problems associated with these compounds, more than 500 reports having been issued by 1968. This book contains the results of that work.

The book reflects the wide range of disciplines dealing with the aflatoxin problem. It has 15 chapters covering the chemistry, production, assay, effects, metabolism, and detoxification of aflatoxins. Many of the data are in tabular form. Several chapters contain information about fungal spoilage of food and about mycotoxins in general. Such generalizations help place the aflatoxins in perspective--that is, in their proper relation with other mycotoxins that may be equally important.

 Abstracter: L. Baldwin

2.117 1969 RESEARCH FLEET OF THE WORLD

Fujinami, Norio (Fishing Vessels Section, Fishing Vessels and Engineering Branch, FAO, Rome, Italy)
FAO Fisheries Technical Paper No. 93, 197 pp. (December 1969) (Frv/T93 Research fleet) (Distribution restricted)

This is a worldwide inventory of vessels employed for fishery research in the oceans and inland waters. It contains an index for locating information in various publications concerning the research craft listed. The scope of the function of the vessels listed covers fishery research, hydrographic survey, oceanography, marine geology and geophysics, and maritime meteorology. The total number of vessels covered is over 1,000 registered in about 70 countries. The report is divided into three sections: (1) Floating Vessels, (2) Underwater Vessels, and (3) Floating Platforms.

Distribution of this Document is restricted. The original version was prepared for the second FAO Technical Conference on Fishery Research Craft held May 18-24, 1968, in Seattle, Washington. Copies have been distributed to FAO members and to the operating agencies of the vessels listed.

 Abstracter: F. T. Piskur

2.15 RECOMMENDED PRACTICES FOR VESSEL SANITATION AND FISH HANDLING

Bowman, Edgar W., and Alfred Larsen (Bureau of Commercial Fisheries, Exploratory Fishing and Gear Research Base, Ann Arbor, Michigan 48103)
U.S. Fish and Wildlife Service, Circular 333, 27 pp. (March 1970)

Abstract.--Current practices aboard commercial fishing vessels have come about largely through trial and error, rather than through the application of research findings. As a result, fishermen have not always kept pace with the increasing demands by consumers for fishery products of higher quality. This report can provide the fishery industry with a measuring stick necessary for self-evaluation, while supplying specific recommendations for improving vessel sanitation and fish handling techniques.

Contents.--

Fish-handling procedures
  Effect of fishing method on quality
  Effective fish handling
Refrigeration of fresh fish
  Fresh-water ice
  Salt-water ice
  Bacterial ice
  Refrigerated brine
Holding fresh fish
  Fish boxes
  Portable bulk containers
  Fish bins
Effective and constant sanitation
  The vessel and equipment
  Vermin controls
Personnel sanitation practices
  Communicable diseases
  Personnel hygiene
Vessel design
  Existing commercial fishing vessels
  Future vessel design

[6 figures]

[Reprinted in part]

2.119 STUDIES ON THE ICE ACCUMULATION ON SHIPS (II)

Morimura, Shinji (Laboratory of Fishing Boat Architecture, Faculty of Fisheries, Hokkaido University, Hakodate, Japan)
Bulletin of the Faculty of Fisheries Hokkaido University 20, No. 3, 185-192 (November 1969) (In Japanese; figures, table, and summary in English)

A means of preventing or reducing the accumulation of ice on ships sailing in northern waters was investigated. Using an air-conditioning duct as a test chamber, the author sprayed sea water for 1 second at 4-second intervals on models made of various materials and in various configurations. Keeping the spray at 0° C. and a constant 25 g./min./section and the air at -10° C. and a velocity of 5 m./sec., he was able to find a relation between the quantity of ice adhering to the various surfaces and the quantity of spray striking those surfaces. Since the total quantity of released heat needed to freeze the spray was revealed by the research, he has high hopes of being able to find a method of solving the ship-icing problem. [10 figures, 1 table, 4 references] [Abstracter: L. Baldwin]

2.113 METHOD AND MEANS FOR PREVENTING THE FOULING OF METAL IN A MARINE ENVIRONMENT

British Patent 1,176,274
Lockheed Aircraft Corp. (pat.)
Chemical Abstracts 72, No. 14, 70560t (April 6, 1970)

1.12

It is very likely that technological change will accompany the flow of investment into world tuna fisheries. This will result in a more rapid exploitation of the tuna resource and accelerate the need for a management program. [2 figures, 4 diagrams, 14 tables, 2 references]

2.1129

Pump's Advantages

...[The]pump will reduce the crew to two and eliminate brailing. When squid are running directly into the funnel, pumping is faster than brailing. Only one man is required to stay on deck to watch over the pumping operation and to chase away the birds, sharks, pilot whales, and sea lions that prey on the squid and cause them to dive. Meanwhile, the second man can sleep and be ready for the long run to the processing plant.

Chief Disadvantage

The chief disadvantage of the pump, at least with the present setup, is that operations are difficult in rough seas. Pumping is also slower than brailing when squid are "dead" under the lights, or when they swim away from the entrance to the funnel.

Encouraged by their early success, [the developers]...decided to enlarge the funnel entrance to 6x4 feet. With this modification, they have landed up to 160,600 pounds...of squid with the pump in one night's fishing. This is a record for a two-man crew.

1.89 THE BIOLOGY OF EUPHAUSIIDS (9.6)

Mauchline, John (The Dunstaffnage Marine Research Laboratory, Oban, Argyll, Scotland), and Leonard R. Fisher
Advances in Marine Biology 7, 454 pp. (1969)

This monograph contains an Introduction; 12 other chapters; author, taxonomic, and subject indexes; and 28 pages of references (about 570 entries). Among the chapters are one on the chemical composition of euphausiids and one on euphausiids in the marine economy. [Abstracter: L. Baldwin]

1.4 SNAPPERS OF THE WESTERN ATLANTIC (1.011b)(1.012)(1.013)

Rivas, Luis R. (Bureau of Commercial Fisheries, Exploratory Fishing and Gear Research Base, Pascagoula, Mississippi 39567)
Commercial Fisheries Review 32, No. 1, 41-44 (January 1970) (Separate No. 860)

This report presents information on the geographical, depth, and temperature-related distributions of 11 species of snappers (Lutjanus spp.) in the western Atlantic. [1 figure, 2 tables, 8 references] [Abstracter: F. T. Piskur]

2.3 (3.24)(3.25) (3.26) 28 TO 32 F TEMPERATURES IDEAL FOR PRESERVATION, STORAGE AND TRANSPORTATION OF POULTRY

Stadelman, W. J. (Animal Sciences Department, Purdue University, Lafayette, Indiana)
ASHRAE Journal 12, No. 3, 61 (March 1970)

On December 19, 1967, a method of preserving, packaging, and molding non-frozen, uncooked chicken was patented (U.S. Patent No. 3,359,122). In January 1968, a master's thesis ("Keeping Quality of Chickens Held at 28 and 32 F," by J. I. Otter) reporting on tests of the shelf-life extension provided by the method was submitted to the faculty of Purdue University. The candidate found that off-odors emitted by conventionally processed chickens were detectable 12 days sooner in chickens stored at 32° F. than in chickens stored at 28° F. In April 1968, a poultry farm that processes and markets about 400,000 broilers a day recorded the first major application of the method.

The system works as follows. Poultry processed under stringently sanitary conditions is chilled for 1.5 hr. in a special chilling tank kept at 33° F., during which their water uptake is about 5 percent. If the product is to be marketed whole, the chilled poultry is then drained for 45 min. at 34° F., covered at the neck with a plastic-sheathed soaker pad, packaged in polyethylene bags, and conveyed for 25 min. through a -40° F. freezer into a holding room maintained at 28° F. If the product is to be cut and tray-packed, the birds go directly from the chilling tank into a 34° F. room, where they are drained for 3 hr. After an additional 15 min. on a drip line, they are cut into parts, drained another 20 min. on the traying line, put on a 15-ply soaker pad in polystyrene trays, bagged

(over)

 Abstracter: L. Baldwin

2.43 (2.5) DRIPLESS FRESH-FISH SHIPPER

Anonymous
Modern Packaging 43, No. 4, 146-147 (April 1970)

Sheet-sealed polyethylene trays, in film-lined corrugated cases, replace wooden crates for shipping fish fillets packed in ice. The tray is 17×12×4½ in. in size and is an injection-molded container (0.070-in. walls) to which an 8-mil polyethylene sheet cover is heat sealed by specially designed equipment. The tray holds 20 lb. of fillets (A smaller tray is also used and it holds 10 lb. of fish.). Four large trays surrounded by 30 lb. of ice are placed face-to-face in pairs in a 6-mil polyethylene film tube and the tube is heat sealed at both ends. The packaged trays and ice are then packed in a film-lined, wax-coated shipper of 275-lb. test single-wall corrugated paper. The shipper is strap closed. The shipper costs about 30 percent more than conventional crates for the same amount of fish.

Benefits of the new method of packing fresh fish for railway shipment are: (1) improved product quality, (2) easier handling, (3) simplified inventories (The new package saves about 66 percent in dry-storage space.), and (4) expanded distribution potential (Protective containers may be packed in plastic-foam-lined cases for air shipment.). [3 illustrations]

 Abstracter: F. T. Piskur

3.15 THE EFFECT OF COMMERCIAL FOOD PROCESSING VARIABLES ON THE INACTIVATION OF CLOSTRIDIUM BOTULINUM BY IONIZING RADIATION AT LOW TEMPERATURES

Snyder, Oscar Peter, Jr. (University of Massachusetts, Amherst, Mass.) Thesis.
Nuclear Science Abstracts 24, No. 6, 990 (March 31, 1970)

The inactivation of Clostridium botulinum 33A and 53B by ^{60}Co gamma radiation was measured in substrates of beef, pork, chicken, and ham at temperatures of 20° to -18° C. and pressures of 760 to 50 torr. The lethality for both organisms follows multihit kinetics characterized by a target number of approximately 16. Type 33A organism was consistently more resistant than was the 53B. Resistance of both organisms increased as the temperature and pressure were reduced. The order of resistance in the substrates were chicken > beef > ham > pork.

3.15 PRESERVATION OF FOOD

Horubala, A.
Przem. Spozyw. 22, 188-192 (1968) (In Polish)
Nuclear Science Abstracts 24, No. 5, 799 (March 15, 1970)

The article examines the industrial application of nuclear energy for the preservation of food. The method appears to be useful for the sterilization of ham, bacon, bone and fish meal, the pasteurization of fresh fish, the extension of the storage life of certain vegetables such as potatoes and tomatoes, and the radio-disinfection of grain.

 Extracter: F. T. Piskur

3.15 (0.38) ENZYMOLOGICAL ASPECTS OF FOOD IRRADIATION

Proceedings of a Panel on Enzymological Aspects of the Application of Ionizing Radiation to Food Preservation, Vienna, Austria, 8-12 April 1968. (July 1969) 116 pp. Price $4.00. Available from the International Atomic Energy Agency, Vienna, Austria, and from its sales agencies throughout the world.
Nuclear Science Abstracts 24, No. 4, 606 (February 28, 1970)

The publication contains the proceedings of the subject panel. Pertinent articles are:

"Effect of Gamma Irradiation on Actomyosin Solutions," by Rose Coelho (CEN de Saclay, Gif-sur-Yvette, France), pp. 1-14;

"Inactivation of Hydrolases in vitro and in situ by ^{60}Co Gamma Rays," by G. Giovannozzi-Sermanni, G. Di Marco, and U. Tomati (Citta Univ., Rome, Italy), pp. 15-21;

"Fundamental Aspects of Enzyme Inactivation by Ionizing Radiation," by T. Sanner and A. Pihl (Norwegian Radium Hospital, Montebello), pp. 23-36;

"Preliminary Studies on the Nature of Radiation Inactivation of Pectin Methyl Esterase and Cellulase Preparations," by K. Vas (Central Food Research Inst., Budapest), pp. 37-45;

"Radiation Processing and the Activity of Enzymes of Importance in the Deterioration of Foods of Animal Origin," by D. N. Rhodes (Meat Research Inst., Bristol, England), pp. 49-62;

"Some Experiments on the Radiosensitivity of Proteolytic Enzymes of Fish Tissues," by G. Siebert and K. Musch (Univ. Hohenheim, Stuttgart), pp. 63-69;

(over)

 Extracter: F. T. Piskur

3.15 RADIATION AND FOOD PRESERVATION

Sutton, H. C. (Inst. of Nuclear Sciences, Lower Hutt, New Zealand)
Food Technology N.Z. 4, No. 3, 4 (March 1969)
Nuclear Science Abstracts 24, No. 5, 799 (March 15, 1970)

The author reviews the status of radiopreservation of foods and speculates on future developments. He also discusses the basic effects of radiation on food products, possible toxic products, economic considerations, safety, and governmental requirements. [22 references] [Extracter: F. T. Piskur]

3.15 EFFECT OF IONIZING RADIATION ON DEVELOPMENT OF DERMESTES MACULATUS (3.4)(3.7)

Pointel, J.-G., and M. Phan Van Sam (IRAT, Nogent sur Marne, France)
J. Stored Prod. Res. 5, 95-109 (August 1969) (In French)
Nuclear Science Abstracts 24, No. 6, 990 (March 31, 1970)

The authors studied the sterilizing effect of gamma irradiation on the pest Dermestes maculatus Deg. (The pest infests dried and smoked fish.) Larvae, nymphs, and adults of D. maculatus were irradiated at doses ranging from 10 to 30 krad; none of the stages so treated gave any progeny and the life span was shortened. [Extracter: F. T. Piskur]

2.3 BESCHICKAUTOMAT FÜR FISCHBEARBEITUNGSMASCHINEN
(1.20) [AUTOMATIC FEED FOR FISH-PROCESSING MACHINE]

Bartels, A. (Nordischer Maschinenbau Rudolf Baader)
West German Patent Application 1,454,092 (1969)
Food Science and Technology Abstracts 2, No. 3, 435, Item 3R108 (March 1970)

This device discharges individual, exactly oriented fish automatically, rhythmically, and at high speed for further processing. It includes an oscillating surface consisting of individual channels that are associated with the rollers, flaps, and spiked and toothed wheels that forward and orient the fish. The device is particularly suitable for such small fish as herring, sprat, and sardine. [Extracter: L. Baldwin]

2.3

in polyethylene stretch bags, and heat sealed. The packaged parts are then moved first into a freezer for crust freezing and then into the 28° F. holding room. The key to the whole system is that the poultry at no time after being processed--in the warehouse, in delivery vehicles, or in the retail display case--is exposed to temperatures lower than 28° F. or higher than 32° F. At 28° F., the free water in or on the meat will freeze, but the poultry flesh will not.

Although the method was designed for poultry, it is directly applicable to other uncooked meats. Granting that it makes possible centralized cutting and packaging and eliminates many of the problems associated with drip loss and spoilage, it creates equipment demands that will require major changes in conventional processing plants, refrigerated trucks, and retail-store display cases. Should the challenge of proper refrigeration be met, a whole new family of convenience foods will be aborning.

3.236 SNACKS AND FRIED PRODUCTS 1969
(3.335)(9.6)

Lachmann, Alfred
Food Processing Review No. 4, 181 pp. (n.d.) $35
Noyes Data Corporation, Noyes Building, Park Ridge, New Jersey 07656

The patent literature on new snack foods and improved processes for producing these foods is the basis of this book. The first five chapters treat potato-, corn-, and apple-derived snacks; the last two describe specialty items and batter mixes. [Abstracter: L. Baldwin]

3.15

"Some Changes in Enzymatic Activities of Citrus Peel Tissues After Fruit Irradiation," by S. P. Monselise, J. Riov, and R. S. Kahan (Hebrew Univ., Rehovoth, Israel), pp. 71-81;
"Changes in Enzyme Activity and Protein Solubility During Storage After Radiation Treatment," by G. Glew (Univ. of Leeds, England), pp. 83-90.
"Enzymatic Stabilization of Radiated Meats," by R. F. Cain and A. F. Angleier (Oregon State Univ., Corvallis, Oregon), pp. 91-102;
"Summaries, Conclusions, and Recommendations of the Panel," pp. 103-108.

2.8 SEASONING COMPOSITION

Canadian Patent 820,835
Matsuda, I., A. Shiga, H. Furukawa, and A. Kanemitsu; Kyowa Hakko Kogyo Co. Ltd. (pat.)
Food Technology 23, No. 12, 71 (December 1969)

Seasoning mixtures contain monosodium glutamate, disodium 5'-guanylate, disodium 5'-inosinate, and monosodium aspartate. [Abstracter: F. T. Piskur]

2.8 SEASONING COMPOSITION

Canadian Patent 820,834
Kinoshita, S., I. Matsuda, A. Shiga, H. Furukawa; Kyowa Hakko Kogyo Co. Ltd. (pat.)
Food Technology 23, No. 12, 71 (December 1969)

Seasoning mixtures contain monosodium glutamate coated with disodium 5'-inosinate, disodium 5'-guanylate, monosodium aspartate, monosodium succinate, or disodium succinate. [Abstracter: F. T. Piskur]

2.8 COLORATION OF FRIED FOODS

Japanese Patent 18902/69
Kajitani, H. (pat.)
Food Technology 24, No. 1, 86 (January 1970)

The surface of fried foods is colored by using edible oils containing xanthin colors. [Abstracter: F. T. Piskur]

3.2344 (1.24)(8.8) AN EFFECTIVE METHOD FOR REDUCING BELLY-BURSTING IN FROZEN OIL SARDINES

Perigreen, P. A., T. K. Govindan, and V. K. Pillai (Central Institute of Fisheries Technology, Cochin 11, India)
Fishery Technology 6, No. 1, 55-58 (1969)

Sardines do not figure much in either the external or the internal trade of India. Only a very small part of the sardine catch ever reaches the fresh fish market; the rest is either processed into oil or guano or is used as is for fertilizer. Few sardines are canned, and none are frozen. The cause is belly bursting. When the fish are thawed after being frozen or stored in ice, their belly walls break and the viscera protrude, spoiling their appearance even though the other organoleptic qualities are not affected.

Investigating ways to solve the problem, the authors found that immersing the fish in 10 percent brine for 60 min. or in 15 percent brine for 30 min. before freezing them would reduce the percentage of belly-bursting by from 10 to 14 percent. It would also give the fish a better appearance and a firmer texture without imparting a particularly salty taste. However, it would accelerate the development of rancidity during storage. They also found that, although the period of frozen storage had no effect on the rate of belly-bursting, the size and fat content of the sardines did--bellies of large sardines that had very high fat content were much less likely to burst during the thawing process.
[4 tables, 4 references]

3.2499 (7.591) ENZYMATIC STUDIES ON THE MUSCLES OF AQUATIC ANIMALS. VIII. CHANGES IN THE ACTIVITIES OF GLYCOLYTIC AND SOME ENERGY-METABOLIZING ENZYMES DURING CHILL AND FROZEN STORAGE

Shibata, Takeshi, Toshio Nakai, and Tsuneyuki Saito (Laboratory of Biochemistry, Faculty of Fisheries, Hokkaido University, Hakodate, Japan)
Bulletin of the Faculty of Fisheries Hokkaido University 20, No. 3, 217-226 (November 1969)(In Japanese; figures and summary in English)

The authors investigated the behavior under varying conditions of storage of glycolytic and energy-metabolizing enzymes extracted from the muscles of squid (Doryteuthis bleekeri and Ommastrephes sloani pacificus) and rainbow trout (Salmo gairdneri irideus). Enzymes extracted with mannite solution were more stable than those extracted with potassium chloride solution. Glyceraldehyde 3-phosphate dehydrogenase (GPDH) and lactate dehydrogenase (LDH) were labile in either case.

During iced storage, the activity of glycolytic enzymes in the minced muscle gradually decreased as storage time increased. No clear trend in the activity of enzymes in whole fish appeared. Contrary to expectations, GPDH, LDH, and the enzymes related to the citric acid cycle increased.

The enzymes of frozen fish stored at -20° C. were separated into two groups, those whose activity changed with the first day of storage and those whose activity did not. The activity of glycolytic enzymes decreased by 20 percent, and that of the enzymes related to the citric acid cycle increased by 20 percent. Phosphofructokinase was the most labile, and GPDH and LDH were the least.

The authors are still investigating the relation between these changes and the biochemical changes observed post mortem.
[6 figures, 34 references]

3.3343 FACTORS CONTROLLING DRAINED WEIGHT IN CANNED PRAWN

Varma, P. R. G., D. R. Chaudhury, and V. K. Pillai (Central Institute of Fisheries Technology, Ernakulam, Cochin 11, India)
Fishery Technology 6, No. 2, 134-139 (1969)

India exports about 2,000 metric tons of canned prawns annually. To make sure that their product is not detained for being short weight, canners often add excess meat, even up to 20 g., to the can. If an average of 10 g. of extra meat is added to the approximately 15,000,000 cans exported each year, about 150 tons (which corresponds to nearly 300 tons of peeled prawn) is wasted in terms of foreign exchange. Thus the problem of controlling the drained weight of canned prawns is of paramount importance to India's trade. Although attempts have been made to explain and to prevent losses due to thaw drip in frozen fishery products, no work has been done on controlling drained weight in canned products. The work reported here was done to supply that need.

Using Mysis dobsoni, the most important species of prawn canned in India, the authors packed 128 g. of meat in 301 ×206 cans and studied the effect of the following variables on the drained weight of the can: (1) filling the can with 3 percent brine containing 0.1, 0.3, 0.5, or 1.0 percent citric acid; (2) filling the can with 3, 5, 7, or 10 percent brine; (3) blanching the meat in 7 percent brine containing 0, 0.1, 0.25, 0.5, or 1.0 percent citric acid; (4) blanching the meat for 4 min. in 0, 5, 7, 10, or 12 percent brine; (5) packing with 0, 20, 40, 60, 80, or 100 ml. of 3 percent brine; (6) sterilizing for 10, 20, 30, or

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3.3343 FACTORS CONTROLLING DRAINED WEIGHT IN CANNED PRAWN
CARD 2
Varma, P. R. G., D. R. Chaudhury, and V. K. Pillai
Fishery Technology 6, No. 2, 134-139 (1969)

Increasing the concentration of filling brine does not affect the drained weight of the can, but it does cause a corresponding increase in the salt content and solubility of the tissue up to the 7.0 percent level; after that, stability is attained. The volume of brine in the can controls the drained weight to some extent, for if the quantity of liquid inside the can is not adequate, the EM level of the tissue cannot be attained. Processing and cooling time (if cooling is by air blowing) affects drained weight. As cooling time increases, moisture content decreases and, as shown before, drained weight increases. But as retort time increases, the amount of protein lost into the filling brine also increases. Although the initial quality of the prawn material--whether fresh, iced, frozen and thawed, or spoiled--in no way affects the drained weight of the can, it does affect the extent of solubility of protein in the blanching brine and, to some extent, in the filling brine. The time required to exhaust the can does not affect the drained weight of the can.

The authors conclude that correct drained weight (128 g.) for a can of tiny prawn can be achieved if the prawns are blanched in 7 percent boiling brine containing 0.2 percent citric acid for 4 min. (2 min. preboiling, 2 min. cooking); cooled and immediately packed in the can with 90 ml. of 3 percent brine containing

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3.4 PREPARED FISH PRODUCT

British Patent 1,163,223
Herring Industry Board (pat.)
Food Technology 24, No. 2, 65 (February 1970)

Chopped kippered herring is mixed with pork fat to produce a product having the consistency of sausage or luncheon meat. [Abstracter: F. T. Piskur]

3.4 SMOKE-FLAVORED OIL

U.S. Patent 3,480,446
Hollenbeck, C. L.; Red Arrow Products Corp. (pat.)
Food Technology 24, No. 4, 148 (April 1970)

Smoke-flavored edible oil is produced by contacting the oil with an aqueous smoke-flavored solution. [Abstracter: F. T. Piskur]

3.4 SMOKE FLAVORED GROUND MEAT

U.S. Patent 3,467,527
Wistreich, H. E.; B. Heller & Co. (pat.)
Food Technology 24, No. 1, 48 (January 1970)

The meat products are flavored with an oil extract of an aqueous smoke-flavoring composition. [Abstracter: F. T. Piskur]

3.336 [USE OF WEIGHT DOSERS OF THE PORTIONING TYPE IN THE FISH INDUSTRY]

Korzhov, V. N. (Kaliningradskoe ministerstvo rybnoi promyshlennosti, SSSR, U.S.S.R.)
Rybnoe Khozyaistvo 45, No. 7, 58-60 (1969)
Food Science and Technology Abstracts 2, No. 1, 128-129, Item 01R34 (January 1970)

When fish cans are filled using weight dosers, it is necessary to make certain that the average weights of the fish portions are equal, or that they vary by less than twice the permitted deviation in the nominal weight of the portion minus one-half the error in the weight of the portion. The conditions for classifying herring and sardines by proportioning-type fish-can dosers are stated on the basis of statistical method. The method described was tested during a canfilling experiment. [Extracter: L. Baldwin]

3.235 FREEZE DRYING OF FISHERY PRODUCTS: PART II-- DEVELOPMENT AND FREEZE DRYING OF PRECOOKED, READY-TO-SERVE FISH SALADS

Govindan, T. K. (Central Institute of Fisheries Technology, Ernakulam, Cochin 11, India)
Research and Industry 14, No. 3, 120-121 (1969) (New Delhi, India)

The author developed high-calorie, ready-to-serve, freeze-dried salads from four kinds of fish. He believes they will be eminently suitable for defense personnel, space travellers, or picnickers--anybody who has neither the time nor the facilities for cooking.

The salads were made from prawns (mixed species), seer (Scomberomorus spp.), tuna (Thunnus spp.), and cullawah (Epinephelus spp.). The fishes were cleaned, cut into convenient-sized pieces, and pressure cooked for 1 hour at 0.7 kg./cm.^{2} steam pressure; when they were cool, the edible meat was manually separated from the bones. The prawns were peeled, deveined, cooked for 30 min. in 7 percent brine, drained, and cooled. To 100 g. of cooked meat, 3 g. of salt was added (none to the prawns, since they were cooked in brine, and 4 to the seer). Then a mixture consisting of 20 g. of refined groundnut oil (only 7 for the seer, which is a fatty fish), from 20 to 30 g. each of tomato and onion, 6 g. of starch (4 for the seer), and from 1.2 to 1.5 g. of pepper was blended with the meat mixture, and the emulsion thus obtained was spread in uniform layers on trays and freeze dried. The vacuum in the freeze-drying chamber was broken with nitrogen, and the salad product was hermetically sealed in cans under nitrogen.

For testing, the products were sprinkled with just enough cold water to soak them and then were served to a taste panel drawn from Central Institute personnel. They were pronounced crisp, very tasty, highly acceptable, and quite wholesome. [2 tables, 3 references] [Abstracter: L. Baldwin]

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0.1 percent citric acid; and autoclaved for 18 min. at 115.2° C. [The National Canners Association (Bulletin 26-L) recommends, and some states require, an autoclaving time of 27 min. at 240° F. for a 307 × 208 can of wet-packed shrimp.] In a later report, they will discuss the acid level required in the filling brine used with various qualities of raw material. [9 tables, 5 references]

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40 min. at 115° C.; (7) blanching for 3, 4, 5, 6, 8, or 10 min. in 7 percent brine; and (8) air-drying the blanched meat for 10, 30, 60, 90, 120, or 180 min.

Blanching is one of the most important steps in the processing of canned prawns. If the drained weight is to be correct, the prawns should be blanched in such a way that the moisture level of the meat is identical with the equilibrium moisture (EM) content of the tissue. Although the EM content of the tissue is governed by the size and the species of the prawn, it is independent of processing time, quality of raw material, or time of blanching. However, if the moisture content of the blanched meat is lower or higher than the EM level, the drained weight, under identical packing and processing conditions, will increase or decrease accordingly. The increase is due to absorption of the filling brine by the blanched meat to attain the fixed EM level of the tissue; the decrease, to the meat's giving up its excess moisture. Under standard processing conditions, about 3 g. of prawn meat is soluble in the filling brine; this solubility does not affect the drained weight, since the water adhering to the surface of the meat compensates for it.

The moisture level of prawn tissue decreases continuously as blanching time increases; eventually a point of stability between moisture level and EM level is reached. At that point, the packed meat retains its weight even after retorting. For tiny prawn, the time is 4 min.; for small prawn, 5 min.; for medium prawn, 6 min.; and for large prawn, 7 min. As the concentration of brine used for blanching increases, the moisture level of the meat decreases and the uptake of salt and, consequently, the drained weight increase. As the concentration of citric acid in the blanching brine increases, the solubility of the tissues increases; however, only if the concentration of acid in the filling brine is increased will the drained weight of the can be affected; in this case, it will be reduced.

Continued on Card 2

3.63 (3.5) AN ACCELERATED METHOD OF HOT AIR DRYING OF FISH

Balachandran, K. K. (Central Institute of Fisheries Technology, Ernakulam, Cochin-11, India)
Fishery Technology 6, No. 2, 124-128 (1969)

Although several methods of drying fish have been reported, they all require an unduly long drying time. To overcome this difficulty, the author studied the effect of relative humidity (RH) and temperature, individually and in combination, on the drying time for fish and worked out a method for accelerating the drying rate without adversely affecting the quality of the final product.

Common commercial varieties of fish--pallikora (Otolithes argenteus), kilimeen (Nemipterus japonicus), mackerel (Rastrelliger kanagurta), and lactarius (Lactarius lactarius) were split open, cleaned, washed, and dried in a tunnel dryer at temperatures ranging from 40° to 60° C. The RH was varied from 40 to 60 percent, but the air velocity was kept at a constant 130 m./min. During drying, the unsalted fish exhibited two distinct drying phases: a constant-rate phase, during which the loss of moisture per unit weight of dry matter per unit time remained constant; and a falling-rate phase, during which the loss of moisture decreased. By increasing the temperature of the air slowly once the falling-rate phase had begun (after about 4 hours' drying time), the author found that moisture loss could be accelerated appreciably without the meat's cooking. Since muscle loses considerable amounts of moisture during the initial stages of drying, and since

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 Abstracter: L. Baldwin

6.132 (9.19) DEODORIZING SAVES SALMON RIVER

Anonymous
Norwegian Fishing and Maritime News 16, No. 4, 21 (1969)

The Irish Fish Meal Company's plant at Mornington (Meath, Ireland) is located on a river used by migrating salmon. For this reason, the river had to be protected from thermal and plant-waste pollution and a nearby urban area from air pollution. The equipment installed to avert these types of pollution is described in brief.

No press liquor or blood water flows back into the river. Specially designed internal entrainment separators reduce the carry-over of droplets to a minimum; therefore condensate is very clean. Two multicoil, series-operating, steam dryers eliminate the odor problem during the drying of whole meal. The exhaust gas from each dryer is discharged at the material inlet end and blown first to the cyclone and then to a gas scrubber; the flow is countercurrent to the cooling water, which enters at the top of the dryer. The scrubber contains an entrainment separator and a water-sealed outlet for the cooling waters. From the scrubber, the exhaust air returns to the dryer. The bleed-off air is vented to the boiler furnace, where the last traces of malodor are destroyed. Because only small amounts of bleed-off air are drawn into the system by the vacuum within the dryers, the operation of the furnace is not disturbed. Within the factory, all machinery possible--including unloading equipment and raw-material storage bins--is air tight. Even the sludge from the separators is put back into the processing line. [3 photographs]

 Abstracter: L. Baldwin

3.64 (4.61)(3.12) STUDIES ON THE STORAGE BEHAVIOUR OF LAMINATED AND COMMERCIAL BOMBAY DUCK

Kandoran, M. K., K. K. Solanki, and R. Venkataraman (Central Institute of Fisheries Technology, Sub-station, Veraval, Gujarat, India)
Fishery Technology 6, No. 2, 140-147 (1969)

Bombay duck (Harpodon nehereus) is India's third largest fishery, about 85,000 tons being landed annually. Most of it is sun dried. Although an appreciable amount of the product is exported to southeast Asian countries, some of it is converted into dried filletlike products that have a large potential market in western Europe. However, dried Bombay duck turns a yellowish brown and then spoils during storage. It is extremely susceptible to variations in the atmospheric humidity, either drying up or, when the humidity exceeds 80 percent, picking up moisture and spoiling during the early part of storage. The authors studied (1) ways of controlling the discoloration and (2) the optimum humidity level at which the commercially dried fish could attain maximum shelf life.

Well-washed, eviscerated fish were tunnel dried for 2 hr. at 40° C. to bring the moisture content of the muscle down to about 85 percent. Then tails and fins were removed, the fish were split longitudinally, and the outspread fish were immersed for 20 min. in 1 percent brine (500 ml. brine to 1 kg. fish) containing varying concentrations of one of the following: butylated hydroxy toluene (BHT), 0.1, 0.2, or 0.3 percent; butylated hydroxy anisole (BHA), 0.1, 0.2, or 0.3 percent; nordihydroguaiaretic acid (NDGA), 0.10, 0.25, or 0.50 percent; ascorbic acid, 0.25, 0.50, or 1.0 percent; sodium pyrophosphate 0.50, 1.0, or 2.0 percent;

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 Abstracter: L. Baldwin

6.31 (9.19) MARINE PHYTOPLANKTON VARY IN THEIR RESPONSE TO CHLORINATED HYDROCARBONS

Menzel, David W., Judith Anderson, and Ann Randtke (Woods Hole Oceanographic Institution, Woods Hole, Massachusetts 02543)
Science 167, No. 3926, 1724-1726 (March 27, 1970)

Wurster (1968) and Södergren (1968) have shown that unicellular algae are singularly capable of concentrating chlorinated hydrocarbons from aquatic media. Just how these compounds affect photosynthesis, though, is not known. To determine whether algae isolated from different oceanic environments respond differently to chlorinated insecticides, the authors conducted the tests reported here.

Skeletonema costatum, a coastal centric diatom; Dunaliella tertiolecta, a naked green flagellate typical of tide pools and estuaries; Coccolithus huxleyi, a coccolithophorid collected from the Sargasso Sea; and Cyclotella nana, a centric diatom also collected from the Sargasso Sea were used in the experiments. Each species was tested for its response to dieldrin (1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octohydro-1,4-endo-exo-5,8,dimethanonaphthalene), endrin (1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octohydro-1,4-endoendo-5,8,-dimethanonaphthalene), and DDT (1,1,1,-trichloro-2,2-bis(p-chlorophenyl) ethane), which are, in that order, the most widely distributed chlorinated hydrocarbons in major U.S. river basins. In all experiments, the cultures were grown in half-strength medium "f" (as described by Guillard et al. in 1962) under fluorescent light (6,000 lux); cell-carbon concentrations were adjusted to 100, 250, or 500 µg. of carbon per liter, all of which are, according to Menzel (1967), within the

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 Abstracter: L. Baldwin

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acetic acid, 1, 2, or 3 percent; or citric acid 0.5, 1.0, or 2.0 percent. After being drained, the brined fish were dried in the tunnel dryer at 40° C. for 14 hr., by which time the moisture content had reached 16 or 17 percent. The fillets were then flattened in a roller press, trimmed at the sides to make them uniform, dried till the moisture content was about 14 percent, gathered into 25- or 50-fillet bundles, packed in polythene bags, and stored at room temperature. For 9 months the products were periodically tested for color and flavor, and those products that were most acceptable were chemically analyzed for moisture, salt, fat, and thiobarbituric acid (TBA).

Commercial samples of Bombay duck prepared by sun drying were stored for 100 days at relative humidities varying from 40 to 100 percent. Color, odor, texture, and equilibrium moisture level were noted at intervals.

The appearance and the TBA values of BHA-treated samples were slightly better than those of the controls. Samples treated with BHT and NDGA at the 0.1 percent level retained their original color, appearance, and taste for up to 9 months; TBA values changed little with changing concentrations of the preservatives. Giving the fillets two immersion treatments in the same brine had little effect on the stored product. Since BHT and NDGA gave identical results, the authors suggest that BHT be used for economic reasons.

Optimum RH for maximum shelf life of dried Bombay duck is about 65 percent. Samples kept at levels below 60 percent RH lost moisture and became brown, rancid, and very hard and brittle. Those kept at levels above 70 percent RH picked up moisture, discoloration, and off-odors early; those at 90 and above became fungus infested as well. [1 figure, 4 tables, 5 references]

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the latent heat required for evaporation comes from the circulating air, the temperature of the muscle does not rise to any appreciable extent. During the later stages of drying, when much of the water has been evaporated from the muscle, an increase in drying temperature does not affect the muscle as much as it would earlier, inasmuch as residual water content is not sufficient to cause cooking.

Since the method proved so successful on fresh fish, the author tried it on salt fish (salting done in the ratio of 1 salt : 5 fish for 18 hr.). The salt fish, however, exhibited no constant-rate phase--the initial high rate of drying suddenly ceased, and the slow rate began almost immediately. This deceleration was counteracted by increasing the temperature, as was done during the falling-rate phase for unsalted fish.

Although high temperatures accelerated the drying rate considerably, temperatures above 50° C. caused a certain amount of cooking. The rate of moisture loss increased as the RH decreased, but when RH was below a certain level, say 40 percent, the product hardened and sometimes even showed surface cracks. On the other hand, when the RH was unduly high, say 60 percent, drying time was increased unduly. Thus,by increasing the temperature of drying after the constant rate period and maintaining the RH at 50 percent, the author considerably reduced drying time without sacrificing quality. [4 figures, 6 references]

3.60 MEAT PRESERVATION

British Patent 1,170,365
Vaessen-Schoemaker Holding N.V. (pat.)
Food Technology 24, No. 4, 84 (April 1970)

Meat is treated with amino acids, such as histidine, and then dehydrated.
[Abstracter: F. T. Piskur]

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range of the carbon concentrations that occur naturally in ocean-surface waters. For short-term dose-response experiments, the insecticides were dissolved in either acetone or ethanol to make solutions varying in concentration from 0.01 to 1,000 p.p.b., and the solutions were added to duplicate cultures of the algae, along with 1 μc of $[^{14}C]Na_2CO_3$. For experiments testing long-term effects on cell division, algal cells at concentrations of about 10^4 cell/ml. of medium (about 200 μg. of carbon per liter) were subjected to daily addition of 100 p.p.b. of insecticide; the cells were counted each day for 7 days.

Up to 1,000 p.p.b., none of the insecticides affected Dunaliella.

The ^{14}C uptake by Skeletonema and Coccolithus was significantly reduced by all three insecticides at concentrations above 10 p.p.b. At 100 p.p.b., DDT blocked cell division in Skeletonema after two or three divisions; it apparently had no effect on Coccolithus. Endrin slowed the rate of growth of Skeletonema cells during the first 5 days and of Coccolithus cells throughout the experiment; it had little effect on the final concentration of cells.

The ^{14}C uptake by Cyclotella was inhibited by all three insecticides at concentrations above 1 p.p.b.; dieldrin and endrin may have been inhibitory at concentrations as low as 0.01 p.p.b. Dieldrin and endrin completely inhibited cell division, whereas DDT only slowed it.

The authors conclude from these findings that marine algae may have markedly different sensitivities and responses to environmental pollutants--some chlorinated hydrocarbons may not even be toxic to some algal species. Because of this toxic selectivity, these compounds may dramatically influence the succession and dominance of certain algal forms. [1 figure, 9 references]

6.30 PHYCOCOLLOIDS

Durrant, Norman W. (Bureau of Commercial Fisheries, Division of Food Science, U.S. Department of the Interior, Washington, D.C. 20240), and F. Bruce Sanford (Bureau of Commercial Fisheries, Division of Publications, Building 67, U.S. Naval Air Station, Seattle, Washington 98115)
Fishery Industrial Research 6, No. 1, 15-51 (March 1970)

Although phycocolloids--gelatinous materials produced from seaweeds--are economically important, they are not widely known materials. This paper discusses the three principal phycolloids manufactured in this country--namely, agar-agar, algin, and carrageenan--and outlines the ways they are produced and the ways they are used. At the manufacturer's level, these three phycocolloids are worth about 15 million dollars a year to the United States.
[45 figures, 26 references] [Authors' abstract]

6.34 WILL KELP KAVO STARCH?

Anonymous
Chemical Engineering (Albany) 76, No. 24, 42, 44 (1969)
Food Science and Technology Abstracts 2, No. 1, 83, Item 01150 (January 1970)

A Vancouver, British Columbia, firm has developed a process for extracting algin from giant kelp by Na_2CO_3 digestion and precipitation as alginic acid or the Ca salt. The process reduces the price of producing a pound of algin from 90¢ to 40¢. One pound of the algin produced in this manner is claimed to be as effective as 10 pounds of starch (which costs 6¢/lb. to produce), so it will likely replace starch for some industrial uses.

A similar Australian process is also described. [Extracter: L. Baldwin]

6.54 (0.7) BIOLOGICAL AVAILABILITY OF THE FLUORIDE OF FISH PROTEIN CONCENTRATE IN THE RAT

Zipkin, I., Sergio M. Zucas (National Institute of Dental Research, National Institute of Health, Bethesda, Maryland), and Bruce R. Stillings (National Center for Fish Protein Concentrate, Bureau of Commercial Fisheries, College Park, Md.)
Journal of Nutrition 100, No. 3, 293-299 (March 1970)

The purpose of this study is to compare the availability of fluoride of fish protein concentrate (FPC) with that of sodium fluoride added to casein diets in the rat. The FPC in this study was prepared by isopropyl alcohol extraction of red hake (Urophycis chuss) and it contained 84% protein, 276 ppm fluoride, and 13% ash. Three diets contained approximately 20, 50, and 80 ppm fluoride furnished by the incorporation of approximately 10%, 20% and 30% FPC in the diet, and three other diets contained similar amounts of fluoride as sodium fluoride and protein from casein. The 10% casein diet without added fluoride acted as the control. At the end of 28 days, femurs, mandibles, molars and incisors of five animals were analyzed for fluroide. The individual carcasses of the remaining five rats of each group were also analyzed for fluoride. The fluoride in the diets containing 20, 50 and 80 ppm fluoride as FPC was 42 to 52%, 39 to 49% and 25 to 35% as available as similar concentrations of fluoride added to the casein diets in the form of sodium fluoride. No incisor striations were seen in any of the groups.

 Authors' abstract

6.54 (1.01512) UTILISATION OF TRASH FISH. II. STUDIES ON PREPARATION OF FISH SOUP MIX

Venugopalan, V., and M. Arul James (Central Institute of Fisheries Technology, Ernakulam, Cochin 11, India)
Fishery Technology 6, No. 2, 148-152 (1969)

Trash fish make up about 30 percent of India's total landings. The possibility of converting the edible parts of such fish into a readily marketable product motivated the study reported here.

Kilimin (Synagris spp.), jew fishes (Otolithes spp.), and silver bellies (Leiognathus spp.) were dressed and then cooked in water (2 parts water to 1 part fish, by weight) for 30 min. The meat was separated, partially deodorized, and blended with an equal amount of water; 107.2 parts of the fish were then mixed with the following ingredients (measured in parts): salt, 9; fat, 8, onion, 70, and coriander, 1, fried to a light brown; starch, 20; glucose, 4; skim milk powder, 8; sodium ascorbate, 0.5; carboxymethyl cellulose, 0.2; monosodium glutamate, 0.2; and pepper, 1. The mixture was then boiled for 5 min., poured in 1- to 2-cm. layers on aluminum trays, and dried at 70° C. in a tunnel dryer for 5 or 6 hr. Finally the dried material was powdered, and sweetener; emulsifier, preservatives, and various nutritive agents were added. The product was then mixed well and packed in polythene-lined aluminum containers.

Storage studies of the soup mix kept at 37° C. for up to 10 weeks showed that the total reducing sugars decreased by 48 percent after 6 weeks' storage.

(over)

 Abstracter: L. Baldwin

6.54 MOLECULAR APPROACH TO BREADMAKING

Pomeranz, Y. (National Barley and Malt Laboratory, Crops Research Division, Agricultural Research Service, Madison, Wisconsin 53705), K. F. Finney, and R. C. Hoseney (Hard Winter Wheat Quality Laboratory, Crops Research Division, Agricultural Research Service, Manhattan, Kansas 66502)
Science 167, No. 3920, 944-949 (February 13, 1970)

This paper is a summary of some studies on the relation between the chemical composition and the bread-making potentialities of wheat flour. An optimized baking test is used for the determination of quality characteristics inherent in wheat and flour components. One parameter of the test is loaf volume. Loaf volume is highly correlated with consumer acceptance, technological versatility, rheological properties, and other important bread-making characteristics including protein content and quality.

Although loaf volume depends primarily on the protein content, the presence of certain lipids tends to improve loaf volume and, in addition, gives a better crumb texture. High concentrations of soy flour in nutritionally improved bread adversely affects loaf volume, but this effect can be counteracted by use of commercially available, synthetic glycolipids. Natural and synthetic glycolipids also improve loaf volume and crumb texture of bread baked from wheat flour enriched with fish protein concentrate, defatted cottonseed flour, sesame seed flour, or food grade yeast.

[6 figures, 1 table, 57 references]

 Abstracter: F. T. Piskur

7.43 (9.19) INVESTIGATION OF ORGANIC POLLUTION OF SURFACE WATERS BY ULTRAVIOLET SPECTROPHOTOMETRY

Mrkva, Miroslav (Hydraulic Research Institute, Ostrava, Czechoslavakia)
Journal of Water Pollution Control Federation 41, No. 11, Part 1, 1923-1931 (November 1969)

The object of this investigation was to confirm the possibility of using ultraviolet spectrophotometry for evaluating the degree of organic pollution in the watershed of the Odra. Presently, organic matter is determined in the laboratory by the general methods of oxidation by permanganate, dichromate, or other oxidizing agents. Since subjective elements appear during practical application of these methods, the results are subject to error. Hence the search for an objective method that will evaluate the characteristic spectra of a series of organic compounds and thus provide not only qualitative information about their organic composition but information that will contribute to their quantitative evaluation.

The author divided the river reaches into three basic groups according to the type of organic pollution involved. Group I included clean stretches with humic substances; Group II had higher concentrations of lignin-sulfonic acids from sulfite pulp mills; Group III included reaches with such other specific organic pollutants as phenols. Since the longest reaches were in Groups I and II, k_1 and k_2, coefficients for these instances, were derived for the conversion of absorbance to the weight concentration of humic acids and lignin-sulfonic acids

(over)

 Abstracter: L. Baldwin

6.52 MINK FOOD

Canadian Patent 829,245
Van Limborgh, C. L.; Stichting Voor Wetenschappelik Onderzoek Op Diervoedergebied (pat.)
Food Technology 24, No. 4, 150 (April 1970)

Dry feedstuffs for mink and other furbearing predator animals contain at least 15 percent crude fat, 25 percent crude protein, and 10 percent ash, and contain not more than 12.5 percent moisture. [Abstracter: F. T. Piskur]

6.54 SYNTHETIC CAVIAR

British Patent 1,167,507
Inst. Elementoorganicheskikh Soedinenу (pat.)
Food Technology 24, No. 4, 148 (April 1970)

The granules contain gelatin, vegetable tanning agents, and gelled aqueous suspensions of edible proteins. [Abstracter: F. T. Piskur]

6.54 RECOVERY OF PROTEIN HYDROLYZATE FROM FISH PRODUCTS

S. African Patent 6,805,890
Roels, Oswald A. (Ryan, John J., and Sons Inc.) (Pat.)
Chemical Abstracts 72, No. 11, 53898s (March 16, 1970)

7.43 EFFECT OF TEMPERATURE ON THE pH OF SEAWATER

Gieskes, Joris M. (Institut für Meereskunde, Kiel, Germany)
Limnology and Oceanography 14, No. 5, 679-685 (September 1969)

Using existing data on the carbonate system in sea water, the author experimentally confirmed that the temperature coefficient of the pH of sea water is +0.0114 pH units per degree Celsius at 1 atm. pressure. Although pH measurements with a given system are reproducible to ±0.005 or ±0.006 pH units, direct pH measurements on sea water are accurate to only about ±0.02 pH units. Thus calculations of the components of the carbonate system are uncertain by 1 percent in bicarbonate and 5 percent in carbonate. These uncertainties can be reduced by half if pH values are derived from a precise determination of such other components of the carbonate system as alkalinity and total carbon dioxide. The equation given can be used to correct the pH of sea water measured in the laboratory to in situ sea-water temperature. [5 tables, 18 references] [Abstracter: L. Baldwin]

6.54 THE ECONOMICS OF MICROBIAL PROTEINS PRODUCED FROM CELLULOSIC WASTES
(0.6)(9.2)

Callihan, Clayton D., and Charles E. Dunlap (Department of Chemical Engineering, Louisiana State University, Baton Rouge)
Compost Science, Journal of Solid Wastes and Soil 10, No. 1-2, 6-12 (Spring-Summer 1969)

Microbial proteins of an acceptable quality can be produced from cellulosic wastes at a cost of about 14 cents per pound of pure protein (Defatted soybean flour was quoted at 14 cents, fish flour concentrate [fish protein concentrate] at 24 cents, chlorella at 17 cents, and Incaparina at 68 cents....). The essential amino-acid content of the single cell proteins was as follows (in grams per 100 grams of protein): arginine, 9.21; histidine, 2.3; isoleucine, 3.0; leucine, 7.7; lysine, 5.6; methionine, 1.8; phenylalanine, 3.3; threonine, 4.3; valine, 5.9; tyrosine, 2.6; half cystine, 0.4; total S amino acids, 2.4; and total aromatic amino acids, 5.9. The cellulose-degrading bacteria were isolated from soil taken from a sugar cane field in Louisiana. The bacterium is a mesophilic, gram-negative rod belonging to the genus cellulomonas.
[4 figures, 5 tables, 3 illustrations, 7 references] [Abstracter: F. T. Piskur]

7.43

and to the oxidizability value. For the upper reaches of the river (reaches that belong to Groups I and II), the author experimentally determined the relation between absorbance at 280 mμ and $\bar{d}$ = 30 mm., oxidizability, and absolute weight concentration of the main components. The results confirmed the theoretically derived values of the conversion coefficients and, thus, the feasibility of using the absorbance value as an adequate measure of oxidizability. These experiences encourage the use of automatic analyzers for determining the content of dissolved organic matter in rivers. [5 figures, 2 tables, 22 references]

6.54

The changes occurring as a result of nonenzymic browning were followed by observations of the color of 80-percent alcohol extract at 438 mμ; the optical density reached maximum in 30 days. The values for total free α-amino nitrogen decreased by about 30 percent within 8 weeks' storage. The decreases in total reducing sugars and free α-amino nitrogen were highest during the first 4 weeks of storage. In agreement with results reported by Sinnhuber and Yu in 1958, the peroxide value increased and the thiobarbituric acid number decreased during storage. The total bacterial count decreased during storage at 37° C. from an initial value of 6.1×10^4/g. to 3.0×10^4/g. after 2 weeks, 9.2×10^3/g. after 4 weeks, 1.4×10^4/g. after 6 weeks, and 7.5×10^3/g. after 8 weeks. At room temperature, the bacterial count also decreased; after 4 weeks, it had dropped to 9.3×10^3/g. The total counts of most of the soup mix samples taken from retail markets were of very good quality, being less than 10^6/g.

The equilibrium moisture content did not vary much up to a relative humidity of 65 percent; thereafter,it increased as the relative humidity increased. The authors recommend, on the basis of this finding, that the fish soup mix be packaged in a material impermeable to moisture at a relative humidity of 70 percent. Organoleptic ratings showed that the maximum shelf life of the mix was 4 months at 29° C. when the moisture content was 6.1 percent.

The authors conclude that cooked and deodorized trash fish can be used successfully to make a fish-soup mix containing about 25 percent protein. The mix can be prepared for use at the table by boiling a 5 percent suspension for 1 or 2 min. Adding 30 parts of precooked beet root was found to give the soup a pale rose color without impairing the taste. [5 figures, 3 tables, 10 references]

7.45 DETERMINATION OF TRACE SULFUR IN FAT BY COMBUSTION AND REDUCTION OF SULFATE TO HYDROGEN SULFIDE

Pippen, E. L., and E. P. Mecchi (Western Regional Research Laboratory, Agricultural Research Service, U.S. Department of Agriculture, Albany, Calif. 94710)
Journal of Agricultural and Food Chemistry 18, No. 2, 301-305 (March-April 1970)

In recent studies on flavor in poultry, the authors needed a method for determining sulfur in poultry fat in the range of 0 to 10 p.p.m. The present paper describes the method they developed.

Five to fifteen grams of fat are burned in about 1 hr. at 1,000° C. in a vertical quartz tube containing a catalyst, vanadium pentoxide. The combustion products are passed through hydrogen peroxide bubblers to absorb SO_2 and to oxidize the SO_2 to sulfate. The sulfate is then reduced with hydriodic and phosphorous acids in acetic acid to hydrogen sulfide; the resulting hydrogen sulfide is determined by the methylene blue method. By this method, the authors could distinguish between samples of fat that differed by only 0.5 µg. of sulfur per gram of fat. Recovery of sulfur added to the fat in the amounts of from 0.5 to 2 µg. of sulfur per gram of fat was 73 to 90 percent.
[2 figures, 3 tables, 19 references]

 Abstracter: F. T. Piskur

7.591 AUTOMATED MULTIPLE ENZYME ANALYSIS SYSTEMS

Bradley, Daniel W., and A. L. Tappel (Department of Food Science and Technology, University of California, Davis 95616)
Analytical Biochemistry 33, No. 2, 400-413 (February 1970)

Beck and Tappel (1967) described automated multiple enzyme analysis, and Pitot et al. (1964; 1965) described systems for the rate analysis of enzyme reactions by continuous and interrupted flow procedures. The present paper reports on the development of automated enzyme analysis systems of greater capacities and flexibilities. The systems were tested by analysis of enzyme activities of lysosomes.

Two automated multiple enzyme analysis systems were designed, developed, and applied. The systems employ two modes of operation: the slaved sampler mode and the programmed multichannel valve mode. Both modes were found to be capable of handling the sequential analysis of preparations containing at least 12 enzymes, including acid phosphatase, N-acetyl-ß-D-glucosaminidase, arylsulfatase, 5′-phosphodiesterases I and IV, α-D-mannosidase, α-L-fucosidase, α-D-glucosidase, ß-D-glucosidase, α-D-galactosidase, ß-D-galactosidase, and ß-D-glucuronidase.

The authors suggest several applications of the slaved sampler mode and the programmed multichannel valve mode: (1) enzyme analysis of various tissues and subcellular fractions, (2) continuous monitoring of chromatograms (performed by periodic sampling of an aliquot of the column effluent), (3) continuous monitoring of zonal centrifugation, (4) discontinuous monitoring of density gradient centrifugations, and (5) the determination of selected enzyme kinetic parameters.
[11 figures, 2 tables, 12 references]

 Abstracter: F. T. Piskur

7.523 AVAILABILITY OF LYSINE IN PROTEIN CONCENTRATES AND DIETS USING CARPENTER'S METHOD AND A MODIFIED SILCOCK METHOD

Ostrowski, H., A. S. Jones, and A. Cadenhead (Department of Applied Nutrition, Rowett Research Institute, Bucksburn, Aberdeen, AB2 9SB, Scotland)
Journal of the Science of Food and Agriculture 21, No. 2, 103-107 (February 1970)

Previous workers have reported that lysine is the first limiting amino acid in many foods of plant origin, especially in cereal grain. Also, the nutritive value of proteins may be related to the amount of lysine in the protein molecule that has free ϵ-amino groups (available lysine). Several methods (chemical, enzymic, microbiological, and biological) have been developed for measuring the availability of lysine in different protein sources. Carpenter's (1960) method is commonly used; however, some researchers report that this method is subject to interference by carbohydrate (especially in vegetable protein concentrates). Roach et al. (1967) developed the Silcock method, and they report that it is not subject to interference by carbohydrate.

The present paper reports on a comparison of the methods of Carpenter and of Silcock for the evaluation of available lysine in protein concentrates and diets. The authors also describe certain modifications to the Silcock method that allow the rapid routine determination of total and available lysine in different protein concentrates and in diets without an automatic analyzer.

With animal protein concentrates, the available lysine values obtained using Carpenter's and Silcock's methods were not significantly different but with vegetable protein concentrates, Carpenter's method gave significantly higher values

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 Abstracter: F. T. Piskur

7.84 IDENTIFICATION OF FISH SPECIES BY A MODIFIED POLYACRYLAMIDE DISC ELECTROPHORESIS TECHNIQUE

Mackie, J. M. (Torry Research Station, Aberdeen, Scotland)
Journal of the Association of Public Analysts 7, No. 3, 83-87 (1969)
Food Science and Technology Abstracts 2, No. 1, 124, Item 01R10 (January 1970)

The method described here is based on the species-specificity of the separation patterns obtained when muscle proteins are subjected to electrophoresis. Raw or partially cooked fish are identified by the patterns given by the water-extractable muscle myogens, and cooked fish from the patterns given by protein fragments extracted in a 6 M urea solution. Frozen fish, either raw or cooked, can be identified equally readily; however, autoclaved or pressure-cooked fish and fish products (for example, fish paste) cannot. The method is of particular value for identifying fish fillets. It is rapid and requires only a few grams of fish flesh. [11 references]

 Extracter: L. Baldwin

7.523

(P <0.01). A short-column system (Silcock technique) appeared to be free from carbohydrate interference.

The modified short-column technique improved the separation of ornithine and lysine. The authors recommend between 25 and 75 µg. of lysine in 1 ml. as the optimum concentration range of lysine for application to a column. A large number of analyses can be carried out by the modified technique without the use of an automatic analyzer system.

[2 figures, 4 tables, 22 references]

7.52 QUANTITATIVE ANALYSIS OF AMINO ACIDS BY GAS-LIQUID CHROMATOGRAPHY AND ITS APPLICATION

Kunisaki, Naomichi, Tsutomu Yoneda, and Yoshio Ishihara (Laboratory of High Polymer Chemistry, Faculty of Fisheries, Hokkaido University, Hakodate, Japan) Bulletin of the Faculty of Fisheries Hokkaido University 20, No. 3, 193-201 (November 1969) (In Japanese; figures, tables, and summary in English)

Gehrke et al. recently developed a gas-liquid chromatographic (GLC) method for the quantitative analysis of amino acids using N-trifluoroacetyl amino acid n-butyl esters. Modifying the method somewhat, the present authors tested its reproducibility and its applicability to biological products. The method was reproducible for all amino acids but histidine and cystine; it was not quantitative for tryptophan and arginine. GLC analysis of the amino acids in a casein hydrolysate was compared with an analysis of these acids made by ion-exchange chromatography. Also, the free amino acids in salmon eggs were analyzed before the eggs were fertilized and 20, 25-30, and 40-50 days after they were fertilized.

[6 figures, 3 tables, 1 diagram, 15 references] [Abstracter: L. Baldwin]

7.461 (9.19) A RAPID COLORIMETRIC ESTIMATION OF LINDANE (γ-ISOMER OF HEXACHLOROCYCLOHEXANE)

Visweswaraiah, K., and M. Jayaram (Central Food Technological Research Institute, Mysore, India)
Journal of Food Science and Technology 6, No. 2, 111-112 (June 1969)

Chlorinated pesticides develop a blue or a green complex when sprayed with o-tolidine and exposed to light. Because the color fades with time, the authors sought a means of extracting and stabilizing it so they could determine optical density as a function of pesticide concentration.

The authors dissolved 0.1 g. of standard lindane solution in enough acetone to make a 100 ml. volume, placed from 100 to 900 µg. in nine petri dishes, and added 0.25 ml. of 1 percent o-tolidine to each dish. All the dishes were exposed to diffused sunlight for 10 min., then covered with dark paper and kept in a dark room. The blue complex formed in each dish was extracted with distilled water saturated with secondary butanol (from 10 to 15 ml.), 2 ml. of 0.22 percent ammonium molybdate was added to stabilize the color, and the optical density of the colored solution was measured.

The blue-colored complex had a maximum absorption at 620 mµ; up to a concentration of 12 µg. per ml. of solvent, it conformed to Beer's law. Blue color extracted with butanol-distilled water faded in from 3 to 5 min.,; ammonium molybdate stabilized the color for from 5 to 10 min. Trials made with pure lindane revealed that the method is accurate within an error of from 1.5 to 5.6 percent.

[2 figures, 2 tables, 10 references] [Abstracter: L. Baldwin]

7.871 (4.5) A RAPID METHOD FOR EVALUATION OF AUTOXIDATION AND ANTIOXIDANTS

Yagi, Kazufumi (Research Institute, Kobe College, Nishinomiya, Japan)
Agricultural and Biological Chemistry 34, No. 1, 142-145 (January 1970)

This paper describes a new method for measuring dissolved oxygen consumption in a given system of oxidizable food components. By this method, relatively large amounts of sample may be used, and the measurement can be made within several minutes. In the tests reported here, the oxidation of ascorbic acid, reductones, and unsaturated lipids was measured in terms of the decrease in dissolved molecular oxygen in the system. Oxidation was induced by adding a metal catalyst (ferrous sulfate) to the system. Changes in the oxygen content of the system were determined with a polarographic Beckman Oxygen Analyzer connected to a recorder.

[4 figures, 3 tables, 4 references] [Abstracter: F. T. Piskur]

6.191 (7.89) CORRECTED DIGESTIBILITY [AS A QUALITY-CONTROL MEASURE] OF PERUVIAN FISH MEAL

Vargas-Nunez, Gaston, and Alfredo Bellido (Univ. Catol. Peru, Peru)
Chemical Abstracts 72, No. 5, 20632x (February 2, 1970)

7.81 (3.2495) THE ACCURATE DETERMINATION OF TOTAL VOLATILE NITROGEN IN MEAT AND FISH. II.

Pearson, D., and M. Muslemuddin (Nat. Coll. of Food Technology, Univ. of Reading, Weybridge, Surrey, England)
Journal of the Association of Public Analysts 7, No. 3, 73-82 (1969)
Food Science and Technology Abstracts 2, No. 1, 124-125, Item 01R13 (January 1970)

The authors applied the vacuum distillation technique for determining total volatile nitrogen (TVN) in meat and teleostean fishes to TVN determinations in elasmobranchs. When they distilled elasmobranch species by the Lucke and Geidel technique (reported in 1935), they obtained very high values, due to the formation of ammonia derived from the decomposition of urea plus that which resulted from protein breakdown. When the fish were distilled at 50° C. under reduced pressure, no further TVN appeared after the first 20 min.; the results were almost identical with those obtained from cold microdiffusion of a trichloroacetic acid extract of the fish juice. The vacuum distillation technique gave good recoveries of ammonia and trimethylamine. It showed that, although the TVN of elasmobranchs stored at 2° C. contains considerable quantities of ammonia derived from urea and protein breakdown, the rate of trimethylamine production decreases during storage, apparently reaching a constant value at some point in storage time.

[10 references] [Extracter: L. Baldwin]

8.46 (7.463) FLUORIDE CONTENT OF FISH PROTEIN CONCENTRATE AND RAW FISH

Ke, P. J., H. E. Power, and L. W. Regier (Halifax Laboratory, Fisheries Research Board of Canada, Halifax, Nova Scotia)
Journal of the Science of Food and Agriculture 21, No. 2, 108-109 (February 1970)

The total intake of fluorides in the diet must be limited (McClure, 1953), and it is important, therefore, to know the content of this element in potentially significant sources. Few detailed data on the fluoride content of fish products are available. The present paper reports on the fluoride content of fish protein concentrate (FPC) and of the possible raw materials that may be used in making FPC.

The authors developed an improved 'nonfusion' method (Ke et al., 1969) for the determination of fluoride based on the use of a fluoride selective solid-membrane electrode. This method gives results that correlate closely with those obtained by the longer A.O.A.C. (Association of Official Analytical Chemists) official method.

The fluoride content of FPC prepared by an isopropanol process ranged from 20 to 760 p.p.m. and depended upon the raw material used in preparing the product. The major source of fluoride in FPC was the fish bones. Ashed fish bones contained from 561 to 6,819 p.p.m. The fluoride content of fish fillets ranged from 2.3 to 5.4 p.p.m. and of whole eviscerated fish from 3.6 to 54 p.p.m.
[3 tables, 16 references]

 Abstracter: F. T. Piskur

8.51 FREE AMINO ACID PATTERN IN INDIAN SHRIMP (METAPENAEUS DOBSONII)

Rangaswamy, J. R., S. V. Suryanarayana Rao, and N. L. Lahiry (Central Food Technological Institute, Mysore 2A, India)
Journal of Agricultural and Food Chemistry 18, No. 2, 298-300 (March-April 1970)

Because free amino acids in fish and shellfish may contribute to the flavor of these ssa foods and also serve as an index of quality, the authors determined the free amino-acid content of the major commercial species of Indian shrimp by means of ion-exchange chromatography. The free amino-acid content of Metapenaeus dobsonii was as follows (expressed in mg.percent): taurine, 237.9±2.0; aspartic acid, 35.4±1.19; threonine, 52.6±1.05; serine, 60.5±0.90; sarcocine, 29.1±1.00; glutamic acid, 117.5±1.37; proline, 2.20; glycine, 88.2±1.67; alanine. 15.7±1.2; valine, 8.7±0.69; methionine, 4.8±0.63; isoleucine, 8.9±0.45; leucine, 17.5±0.86; tyrosine, 19.4±0.76; phenylalanine, 7.6±0.88; tryptophan, 18.4±1.94; histidine, 34.9±1.10; lysine, 48.2±0.31; and arginine, 219.4±2.21.
[2 figures, 1 table, 15 references]

 Abstracter: F. T. Piskur

8.8 ON THE FORMATION OF HISTAMINE DURING LOSS OF FRESHNESS AND PUTREFACTION OF VARIOUS MARINE PRODUCTS

Takagi, Mitsuzō, and Atsushi Iida (Laboratory of Food Hygiene, Faculty Fisheries, Hokkaido University), Hanako Murayama and Suga Sōma (Course of Nutritional Science, Hakodate Junior College, Hakodate, Japan)
Bulletin of the Faculty of Fisheries Hokkaido University 20, No. 3, 227-234 (November 1969) (In Japanese; figure, tables, and summary in English)

The amount of histidine and histamine that accompanies putrefaction and the loss of freshness in the muscles of 21 aquatic species was determined by the ninhydrin reaction with an amino-acid analyzer.

The fish were classified into three types according to the amount of histamine in the muscle after it had been held for 48 hr. at 25° C. The largest amounts (from 70 to 263 mg./100 g.) appeared in five red-muscled fish: Sardinops melanosticta, Engraulis japonica, Cololabis saira, Seriola quinqueradiata, and Scomber japonicus. Comparatively small amounts (less than 10 mg./100 g.) appeared in seven species: Hemiramphus sajori, Trachurus japonicus, Konosirus punctatus, Clupea pallasi; Paralichthys olivaceus, Limanda herzensteini, and Kareius bicoloratus. No histamine appeared in five species of white-muscled fish: Sebastes vulpes, Sebastolobus macrochir, Lipidotrigla microptera, Ditrema temmincki, and Hypomessus japonicus.

Small amounts of histamine (less than 3 mg./100 g. appeared in the muscles of two of the shellfish: Todarodes pacificus and Pandalopsis japonica. Although

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 Abstracter: L. Baldwin

9.11 SECOND NATIONAL OCEANOGRAPHIC SYMPOSIA. ABSTRACTS OF PAPERS

Anonymous
Sea Harvest & Ocean Science, pp. 27, 29-31 (February/March 1970)

Abstracts for most of the 49 papers presented at the symposium, which was held in Victoria, British Columbia, November 17-21, 1969, are given. The titles of some of the papers, along with the authors and a brief resumé, are listed below.

"The Automatic Determination of Nutrients in Sea Water," by K. S. Stephens, Environmental Research Group, Nanaimo, B.C. (A method is given for simultaneous, automated determination of reactive phosphate, silicate, and nitrate in sea water.)

"Some Factors Affecting the Precision and Accuracy of Salinity Data," by E. M. Levy, Atlantic Oceanographic Laboratory, Bedford Institute. (A procedure for negating such factors as the effect of pretreatment of sample bottles, the rate of evaporation of water from the bottles, and the effect of time of storage on the conductivity ratio is included.)

"Industry and Oceanography," by M. J. Colpitts, Department of Industry, Trade & Commerce, Ottawa. (The author's department is working closely with the marine industry toward increasing the industry's ability to apply the knowledge being acquired through oceanography.)

"The Use of Computed Mass Transport in Ecological Studies," by W. Percy Wickett, Environmental Research Group, Nanaimo, B.C. (The use of mass transports calculated from Fofonoff's 5° grid program is extended to studies on herring, fur seal pups, and salmon.)

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 Abstracter: L. Baldwin

8.51 (3.337) [CONTENT OF TRYPTOPHANE AND HYDROXYPROLINE AMINO ACIDS IN SOME FISH FROM THE VOLGA AND CASPIAN REGIONS]

Mel'kova, L. A. (Astrybvtuz, U.S.S.R.)
Rybnoe Khozyaistvo 45, No. 5, 65-66 (1969)
Food Science and Technology Abstracts 1, No. 12, 1610, Item 12R332 (December 1969)

The concentration of tryptophan and hydroxyproline in the muscle tissue of fish from the Volga-Caspian region and the changes in concentration during processing were studied. Both these amino acids were stable at temperatures normally used during canning. Hydroxyproline could not be determined in fish canned in tomato sauce containing pyrrole derivatives, which affect color reactions. Using the ratio of tryptophan to hydroxyproline as a measure of the biological value of protein, the author concluded that the value of fish meat is higher than that of beef. [1 reference] [Extracter: L. Baldwin]

8.0 BIOCHEMICAL STUDIES ON MARINE ZOOPLANKTON.
VII. OBSERVATIONS ON CERTAIN DEEP SEA ZOOPLANKTON

Raymont, J. E. G., R. T. Srinivasagam, and J. K. B. Raymont (Dept. of Oceanography, Univ. of Southampton, Southampton S09 5 NH, England)
Internationale Revue der Gesamten Hydrobiologie 54, No. 3, 357-365 (1969)

The authors hypothesized that the proximate biochemical composition of deep-living zooplankton might possibly differ from that of the boreal zooplankton species analyzed by Raymont et al. earlier in 1969, that of neritic and bathypelagic mysids investigated by several authors between 1966 and 1969, and that of decapods analyzed by Raymont et al. in 1967. Therefore they analyzed several bathypelagic species of decapods, mysids, and chaetognaths to determine the fractions of protein, lipid, and carbohydrate present. The table gives their findings.
[1 table, 3 tables, 10 references]

Concentration of protein, lipid, and carbohydrate in various deep-sea zooplankton

Zooplankton	Fractions					
	Protein		Lipid		Carbohydrate	
	A*	B**	A*	B**	A*	B**
Decapods						
Acanthephyra	14	77	4	21	0.4	2
Systellaspis	20	78	5	20	0.5	2
Funchalia	16	85	3	13	0.4	2
Oplophorus	14	65	7	33	0.5	2
Mysids						
Eucopia	22	58	15	40	0.6	2
Gnathophausia	8	65	4	30	0.6	5
Chaetognath						
Eukrohnia	19	77	5	20	0.7	3

*A = Value as a percent of wet weight.
**B = Value as percent of total organic content, excluding chitin.

[Abstracter: L. Baldwin]

9.11

"Geographical Variation in the Biochemical Composition of Zooplankton," by J. L. Littlepage, University of Victoria, Victoria, B.C. (Abstract not given)

"Mooring Techniques on the Continental Shelf," by S. Huggett, Canadian Hydrographic Service, Victoria, B.C. (Specialized deck equipment, safety precautions, and the resistance to wear and corrosion of moorings and instruments are also described.)

"Current Measurements From Moored Buoys in the Strait of Georgia," by S. Tabata, Pacific Oceanographic Group, Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C. (This is, in effect, a progress report on the program begun in 1968.)

"A Water Pollution Survey in the Strait of Canso," by D. J. Lawrence, Atlantic Oceanographic Laboratory, Bedford Institute. (Discussed are background levels and variability of seven chemical parameters in the Strait, the flushing characteristics of the Strait, and the potential hazards from some $250,000,000 worth of heavy industry--including a large oil refinery with its fleet of super tankers--presently under construction in the Strait area.)

9.10 METHODS OF ASSESSING FISH RESOURCES AND FORECASTING CATCHES

National Science Foundation, Special Foreign Currency Science Information Program, Washington, D.C. Order No. TT-69-55063. Price $3.00.
Translation of Vsesoyuznyi Nauchno-Issledovatelskii Institut Morskogo Rybnogo Khozyaistva i Okeanografii, Moscow. Trudy (USSR) 62, 314 pp. (1967).

The report discusses methods of evaluating the state of fish stocks and of forecasting catches. The report is based on information presented at a special U.S.S.R. conference of scientific workers. [Abstracter: F. T. Piskur]

8.4 (9.19)(0.8)(0.2) A CHEMICAL ENGINEER'S GUIDE TO SEA WATER. II.

McIlhenny, William E., and M. A. Zeitoun (Dow Chemical Co., Midland, Michigan)
Chemical Abstracts 72, No. 6, 24447p (February 9, 1970)

8.8 (9.6) PRACTICAL FOOD INSPECTION

Martin, C. R. A.
H. K. Lewis & Co. Ltd., London. vii + 770 pp. (Seventh Edition, 1969) 100s.
Food Science and Technology Abstracts 2, No. 2, 155, Item 2C34 (February 1970)

This revised edition of a text on food inspection and quality and purity control is divided into four parts: meat inspection; fish, poultry, and other foods; food treatment and epidemiology; and legal procedure. Among the chapters are the following: "Parasites" (pp. 230-293), "Preservation of Meat" (pp. 294-320) "Fish" (pp. 323-378), "Canned Foods" (pp. 446-465), "Food Additives and Contaminants" (pp. 599-628), "Food Poisoning" (pp. 629-653), and "Food Hygiene" (pp. 654-670).

[Extracter: L. Baldwin]

8.8

none appeared in the muscle of either Paphia (Paratapes) undulata or Pandalus hypsinotus, a small amount was found in the eggs of the latter.

The decrease of histidine and the formation of histamine tended to be slower in Seriola quinqueradiata than in Scomber japonicus and Cololabis saira; these muscle changes were faster in Cololabis saira than in Scomber japonicus. In any of the fish, more histidine was found and more histamine was formed in ordinary muscle than in dark muscle.

The authors conclude that the degree of histamine formation in marine animals tends to be governed by the concentration of histidine; however, the amount of histamine formed is not proportional to the amount of histidine lost.
[1 figure, 6 tables, 32 references]

9.1 (2.12) PROCEEDINGS OF THE FAO CONFERENCE ON FISH BEHAVIOUR IN RELATION TO FISHING TECHNIQUES AND TACTICS

Ben-Tuvia, A. (Marine Biology and Environment Branch, Fishery Resources and Exploitation Division, FAO), and W. Dickson (Fishing Operations Branch, Fishery Resources and Exploitation Division, FAO) (editors)
FAO Fisheries Report No. 62, vol. 3, pp. 463-884 (November 1969). FRm/R62.3 (Tri)

This report is the third and last volume of the Proceedings of the FAO Conference on Fish Behaviour in Relation to Fishing Techniques and Tactics held in Bergen, Norway, on October 19-27, 1967. It contains the last of the experience papers presented to the conference. The first volume contains the report of the conference, list of contributions, and list of participants. The second volume contains the review papers and the first part of the experience papers.

This third volume contains 38 articles on the stated subject. The abstracts are in English, French, and Spanish. All articles except one are in English. That one article is in French.

Copies of the report have been distributed to the FAO Department of Fisheries, FAO regional fisheries officers, FAO member and associate member nations, participants and contributors, and regional and intergovernmental bodies.

 Abstracter: F. T. Piskur

9.16 (0.8) FISH FARM ENCLOSURES. 2--PRESSURES ON THE STRUCTURE

Milne, P. H.
World Fishing 19, No. 1, 32-33 (January 1970)

In designing permanent structures to form enclosures in sea lochs or coastal waters, the engineer must consider the weight of the structure, the maintenance and operational loads, the dynamic loads (that is, the loads from wind, waves, and tidal currents), and the collision and mooring forces. In addition, he must consider the effects of corrosion, marine fouling, and scouring of the seabed around the foot of the structure. The design requirements of the structure govern the weight and the maintenance and operational loads, so they can be controlled. (The latter will depend on the size of the enclosure and the type of netting fabric that is used.) However, the dynamic loads must be calculated in terms of probabilities, so they must provide for extremes.

An equation is given for calculating wind force, taking into account gust speeds: $\underline{f} = \underline{a} \times 0.004\underline{v}^2$, where $\underline{f}$ is the wind force, in pounds; $\underline{a}$ is the area perpendicular to the direction of the wind, in square feet; and $\underline{v}$ is the wind velocity, in miles per hour of wind gust. If the netting is likely to be fouled by drift weed, say, the percentage of the net fouled must be considered, so a resistance coefficient, K, is inserted into the formula. ($K = \frac{1 - \beta}{\beta^2}$, where β is the blockage coefficient $(\underline{1} - \underline{d}/\underline{l})^2$, $\underline{d}$ the mesh diameter in feet, and $\underline{l}$ the nominal mesh size in feet.) The formula, then, becomes $F = K \times \frac{1}{2}\rho V^2$, with F being the wind

(over)

 Abstracter: L. Baldwin

9.17 (0.8) SOME FACTORS AFFECTING RESERVOIR FISHERIES

Stroud, R. H. (Sport Fishing Institute, 719-13th Street NW, Washington, D.C. 20005)
SFI Bulletin No. 210, 1-4 (November-December 1969)

This article summarizes the author's remarks at the Annual Convention of the National Reclamation Association, Spokane, Washington, October 23, 1969.

The impoundment of water in reservoirs can affect the temperature regime of the river system, and thus the upstream and downstream ecology as well as that of the reservoir itself. The major factors governing the effect of reservoir outflow on the downstream environment are the size and design of the reservoir and the associated impounding structure, the location of the reservoir relative to the main stream and the tributaries, its elevation, the location of outlets in relation to reservoir depth, and the climate of the region. If, for example, a reservoir is relatively shallow, has a low storage capacity, and is located on the main stem of a river and if the water is drawn off through epiliminal discharge outlets, downstream water temperature will be increased. The reverse will be true if the reservoir is deep enough to stratify, stores large volumes of water for a long time, and is located at relatively high altitudes well up the main stem of the river, or on a tributary, particularly if the discharge is from the hypolimnion.

Investigations into the effects of water discharge from various depths on the fish populations and the water quality in reservoirs and tailwaters showed that outlet depth (in particular, the square of the logarithm of the outlet depth) was

(over)

 Abstracter: L. Baldwin

9.17 INVESTIGATION OF C_{20} TO C_{25} FATTY ALCOHOLS AND BLENDS AS WATER EVAPORATION RETARDANTS

Simko, Alexander J., and Russell G. Dressler (Trinity University, San Antonio, Texas 78212)
Industrial and Engineering Chemistry Product Research and Development 8, No. 4, 446-450 (December 1969)

Saturated fatty alcohols are useful as surface monolayer film retardants of water evaporation. Earlier workers found that pure, odd- and even-numbered saturated alcohols of carbon numbers C_{13} to C_{20} used individually provided water evaporation savings that increased linearly with carbon chain length. Others found that certain mixtures of even- and odd-numbered alcohols (C_{14} to C_{20} range) gave extraordinarily high water evaporation retardation efficiencies, appreciably above those of the pure individual materials. In the present study, the authors examined various alcohol blends in the carbon range of from C_{20} to C_{25} to determine whether these alcohols might be more efficient as water evaporation retardants than those with lower carbon chain lengths. They prepared pure samples of odd and even saturated C_{20} to C_{25} fatty alcohols and tested them individually and in blends.

They found that the peculiar characteristics of the alcohols and their blends fit no standard pattern and that mixtures of closely related alcohols can be much more effective than either component separately. A linear relation between efficiency of retardation of water evaporation and carbon chain length for the alcohols in the C_{20} to C_{25} range did not exist. Maximum efficiency results from

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 Abstracter: F. T. Piskur

9.16

force, in pounds; K the resistance coefficient; p the density of air, 0.00238 slug per cubic foot; and V the velocity of the wind, in feet per second. If a trash net is put alongside the fish-retention net, the net structure must be able to withstand the wind forces exerted against the combined nets.

Also discussed in the article are the comparative strengths of various types of netting (synthetic and natural, fibrous and metallic) over various periods of time during which they are subjected to sunlight, corrosion, pholad damage, and marine fouling. [1 figure, 1 table, 17 references]

9.16 PACIFIC OYSTER CULTURE IN BRITISH COLUMBIA
(1.81)

Quayle, D. B.
Bulletin 169, 193 pp. (1969). Published by Fisheries Research Board of Canada, Ottawa. Price $5.00. Order from the Queen's Printer, Ottawa, Canada.
FAO Fish Culture Bulletin 2, No. 2, 22 (January 1970)

The book covers the biology, the various aspects of culture, and the processing and marketing of oysters in British Columbia. It also discusses pollution of the environment and administration of the fisheries. [Abstracter: F. T. Piskur]

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simple ratio proportions in the binary mixtures tested--suggesting a packing arrangement of the molecules in the monolayer.

Evaporation retardation efficiencies in the range of from 80 to 85 percent were obtained using blends of fatty alcohols. These laboratory results would suggest a goal of 65 to 70 percent efficiency when applied to large outdoor reservoirs (assuming that other factors pertinent to outdoor application are compatible). The studies indicate possible water savings for large reservoirs of $0.01 to $0.015 per 1,000 gallons under favorable conditions.
[7 figures, 13 references]

9.16 FONDFISH FARMING IN NORWAY [DAMFISKNAERINGENS I NORGE] - (1.37)(1.0141) SURVEY OF THE SITUATION TODAY, AND AN EVALUATION (1.0142) OF SOME PROFITABILITY FACTORS

Berge, Leidlov
Translated from Norwegian by the U.S. Joint Publications Research Service for the Bureau of Commercial Fisheries. Issued by the Office of Foreign Fisheries Service, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C., 121 pp. (1969)
FAO Fish Culture Bulletin 2, No. 2, 23 (January 1970)

The paper gives accounts of trout farming in Norway and Denmark and discusses the production, marketing, and economics of fish culture in Norway.

[Abstracter: F. T. Piskur]

9.12 SERUM LIPIDS AND THE DEATH OF SPAWNING PACIFIC SALMON
(7.773)

Patton, Stuart (Division of Food Science, Pennsylvania State University, University Park 16802), G. F. Crozier (Marine Science Institute, University of Alabama, Bayou La Batre 36509), and A. A. Benson (Scripps Institution of Oceanography, University of California, La Jolla 92037)
Nature 225, No. 5234, 754-755 (February 21, 1970)

Blood serum lipids of pink salmon, Oncorhynchus gorbuscha, caught at two points in the spawning route were compared. A large triglyceride component consistently appeared in individual as well as pooled serum samples of both male and female salmon caught just off the coast. Little or no triglyceride appeared in similar serum samples of salmon caught some 60 mi. upstream on the spawning grounds. Apparently sex is an unimportant factor in the serum triglycerides and the total serum lipids. Only one or two of the serum lipid samples showed even faint evidence of diglycerides and none showed evidence of monoglycerides. Cholesterol levels of the ocean-caught and the stream-caught fish were fairly similar--the former averaged 54 percent esterified and 46 percent free cholesterol, the latter averaged 60 percent esterified and 40 percent free cholesterol. Largely due to two fish in the ocean group that had unusually high levels of free fatty acids (44 and 52 mg./100 ml.), the serum free fatty acids of the ocean fish averaged somewhat higher than those of the spawning-ground fish.

The authors conclude that, since spawning streams could not possibly supply millions of mature fish with an adequate food supply during their migration, the weight loss and serum-lipid depression of spawning fish indicate that they are starving. [1 table, 10 references] [Abstracter: L. Baldwin]

9.17

the dominant measured physical property related to dissolved oxygen profiles--the greater the outlet depth, the higher the levels of dissolved oxygen to be found at maximum depth, at mean depth, and at depths below the thermocline. These findings corroborated the data from a preliminary study (made in 1967) indicating that outlet depth is highly correlated (positively) with the proportion of depth below the thermocline that contains oxygen.

Collectively, these findings strongly suggest that outlet location (among other key factors) exerts substantial influence on the water quality and biological productivity of large stratified reservoirs. The author suggests, therefore, that alternating epiliminal and hypoliminal discharge systems should produce measureable water-quality-related differences in reservoir and downstream biota.
[4 figures, 11 references]

9.16 FISHCULTURE SURVEY REPORT FOR WEST CENTRAL AFRICA
(1.0161)

Moss, D., D. G. B. Pardue, and M. J. Danner (Auburn University, Agricultural Experiment Station, Auburn, Alabama)
Issued by USAID-Auburn University Project AID/csd-1581, pp. 115.

The report is a summary of the status of the development of the freshwater fisheries (including the marketing and economic aspects) in Senegal, Central African Republic, Cameroon, Nigeria, Togo, Ghana, and Ivory Coast, Africa.

[Abstracter: F. T. Piskur]

9.19 (9.6) WASTE WATER PROBLEMS

Eden, G. E. (reviewer)
Urban Planning Aspects of Water Pollution Control
Sigurd Grava (Institute of Urban Environment, Columbia University, New York City)
Columbia University Press, New York and London (November 1969), xi + 223 pp. $7.50
Nature 225, No. 5234, 767-768 (February 21, 1970)

The major questions about water pollution are not concerned with technical solutions (in most cases, these are available) but with how much the community is prepared to pay for a clean environment. Accordingly, the author of this book deals with the general nature of the problem, the technology of waste water treatment, legal and financial implications of the problem, aspects of local planning, and problems peculiar to developing countries. The reviewer criticizes the lack of reference to work that is being done in the Old World (he points out that the only reference to European experience is a brief description of the Ruhrverbrand operation, the highly successful water-supply and effluent-disposal organization in West Germany) and the limited applicability of the material contained (most of the technical matter is available in a number of specialized publications, he says, and those parts of the book dealing with administrative, legal, and financial matters refer almost exclusively to the situation in the United States). He concludes that the last chapter, which deals with problems in developing countries, is sensible and is apparently based on the author's experience as a planning consultant.

 Abstracter: L. Baldwin

9.19 RECENT DEVELOPMENTS IN INTERNATIONAL ENVIRONMENTAL POLLUTION CONTROL

Jordan, Frederick J. E. (Faculty of Law, Queen's University, Kingston, Ontario, Canada)
McGill Law Journal 15, No. 2, 279-301 (June 1969)

In this survey of the laws and machinery for dealing with problems of environmental pollution in Canada and the United States, the author indicates a number of weaknesses in them in relation to the abatement and control of transboundary pollution. Problems arise in relation to the coordination of research activities and investigations, allocation of financial resources, establishment of uniform standards of quality control and means of enforcement; and even though a local program may be satisfactory in a particular jurisdiction there is no assurance that the program will be effective in its contribution to the solution of the international problem. In order to strengthen the joint machinery which has been established to ensure the observance of the international obligations resting on Canada and the United States to prevent injurious transboundary pollution, the author suggests: (1) the government could add a clause to the Boundary Waters Treaty affirming with regard to transboundary air pollution the same obligation which is spelled out in relation to water pollution. The two governments might also, in relation to both obligations, undertake to give domestic effect by enacting the necessary legislation. (2) The governments could vest the International Joint Commission (IJC) (created by the Boundary Waters Treaty) with jurisdiction over all matters of boundary water and air pollution which were having transboundary effects in relation to initiating the investigation without awaiting

(over)
 Abstracter: F. T. Piskur

9.19 (6.13) (0.6) EFFECT OF COMMERCIAL PROCESSING TECHNIQUES ON LINDANE- AND DDT-^{14}C RESIDUES IN RAPESEED OIL

Saha, J. G. (Canada Agriculture Research Station, University Campus, Saskatoon, Sask., Canada), M. A. Nielsen, and A. K. Sumner (College of Home Economics, University of Saskatchewan, Saskatoon, Sask., Canada)
Journal of Agricultural and Food Chemistry 18, No. 1, 43-44 (January-February 1970)

Earlier work has shown that (1) commercial and home processing techniques considerably reduce the levels of pesticides in raw garden vegetables, (2) commercial vacuum processing of milk does not significantly reduce the heptachlor, dieldrin, and DDT content of milk but it does reduce the lindane content by about 24 percent, and (3) most organochlorine insecticides are relatively resistant to the processing techniques used in the milk and dairy industry. In view of these observations it was of interest to determine the fate of insecticides in edible vegetable oils that are processed (alkali-refined, bleached, deodorized, and sometimes hydrogenated) before being marketed. The present paper reports on the effects of simulated commercial vegetable processing techniques on the removal of lindane and DDT residues in rapeseed oil.

Alkali-refining and bleaching had little or no effect on lindane and DDT in the rapeseed oil. Deodorization of the rapeseed oil by heating it in the presence of water vapor at from 230° to 260° C. and 6 mm. of Hg pressure for 4 hours removed from 95 to 99 percent of the lindane and DDT residues.
[1 table, 12 references]

 Abstracter: F. T. Piskur

9.2 (9.16) CATFISH INDUSTRY FACES GROWING PAINS

Anonymous
Feedstuffs 42, No. 6, 14, 68-69 (February 7, 1970)

Mergers, acquisitions, and the formation of partnerships within the catfish industry and with outside interests are a major factor in keeping the catfish-farming industry viable. The entrance of outside capital, business acumen, and technological expertise as a result of these actions will go a long way toward solving the problems that presently impede growth and stability. For the catfish farmer, these problems center on inadequate water supplies, which lead to losses of fish, including losses from disease and bacterial infections; haphazard and even primitive methods of holding, handling, sorting, and harvesting; and, commonly, insufficient size and experience to manage efficiently. For the producer, the problems center on inadequate supplies and erratic deliveries, which lead to prohibitively high processing costs (increasing them by as much as 20¢ a pound) and, in turn, consumer resistance; improper processing methods and inadequate sanitary measures, both of which affect product quality; and nonconformance with portion control and packaging requirements of specialized markets, resulting in excessive inventories (by October of 1969, the backlog of frozen catfish products had reached over half a million pounds). Both producer and processor are hampered by a lack of practical, adequate marketing information.

 Abstracter: L. Baldwin

9.19 INFLUENCE OF ORGANOPHOSPHATE INSECTICIDES ON ASCORBIC ACID OXIDATION IN AQUEOUS SYSTEMS

Rehfeld, Betty M., and Dan E. Pratt (Department of Food and Nutrition, University of Wisconsin, Madison 53706)
Journal of Food Science 34, No. 6, 551-553 (November-December 1969)

Biodegradation of pesticides is brought about by reactions involving oxidation, reduction, and hydrolysis--all of which reactions are catalyzed by enzymes, by metals, and by oxidizing and reducing agents. The present study was carried out to determine if organophosphate insecticides and their breakdown products effect ascorbic acid oxidation in vitro.

Aqueous systems at pH 2.2, 4, 6, and 8 and containing ascorbic acid and various levels of organophosphate insecticides were prepared, and the rate of ascorbic acid oxidation was measured polarographically.

The organophosphate insecticides tested showed antioxidant activity. Malathion, in the presence of copper ions, lost its antioxidant activity when EDTA (ethylenediaminetetraacetic acid) was added. Oxygenated, oxidized, and hydrolyzed organophosphate insecticides retained some antioxidant activity. The phosphate moiety of malathion probably is responsible for the antioxidant activity. The authors postulate that the antioxidant activity of organophosphate insecticides might be due to the ability of the phosphate grouping to chelate metal ions. [4 figures, 4 tables, 15 references]

[Abstracter: F. T. Piskur]

9.19 (9.13) THE EFFECT OF SUBLETHAL CONCENTRATION OF LAS ON THE ACUTE TOXICITY OF VARIOUS INSECTICIDES TO THE FATHEAD MINNOW (PIMEPHALES PROMELAS RAFINESQUE)

Solon, Joseph M., Jeffrey L. Lincer, and John H. Nair III (Syracuse University Research Corporation, Life Science Division, Syracuse, New York)
Water Research 3, No. 10, 767-775 (October 1969)

Because a wide variety of toxicants may be present in surface waters, there is a need for information on the combined toxicity of these contaminants to fish and other organisms. This paper reports on the acute toxicities of DDT, endrin, and parathion in the presence and absence of linear alkyl benzene sulfonate (LAS) under constant flow conditions. When the fathead minnow was simultaneously exposed to lethal concentrations of parathion and a sublethal concentration of LAS, the two compounds showed a synergistic toxic action. Similar tests for DDT were inconsistent, and the variability of DDT toxicity appeared to be too great to accurately demonstrate any synergistic action with LAS. Endrin and LAS showed no synergism between the two compounds.

[6 tables, 23 references]

[Abstracter: F. T. Piskur]

9.2 (9.16) ECONOMICS OF FISH FARMING AND HOW IT RELATES TO TROUT AND CATFISH INDUSTRIES

Greenfield, J. E. (U.S. Bureau of Commercial Fisheries, Ann Arbor, Michigan)
American Fishes and U.S. Trout News, 14, No. 4, 6-8, 19-26 (November-December 1969)

The status of the catfish industry, Fall 1969, is described in terms of its size, location, cost structure, and sensitivity to changes in management practice and business environment. Specific, detailed attention is devoted to production economics. Other patterns of development, trends, and threats to the industry are described and analyzed.

This analysis characterizes the high profit potential that exists in the industry, as well as some of the negative aspects of the industry that should temper the enthusiasm of new venture capital. [Author's abstract]

9.19 (7.43) MEASUREMENT OF POLLUTANT TOXICITY TO FISH. I. BIOASSAY METHODS FOR ACUTE TOXICITY

Sprague, J. B. (Fisheries Research Board of Canada, Biological Station, St. Andrews, New Brunswick, Canada)
Water Research 3, No. 11, 793-821 (November 1969)

This review paper describes profitable methods for measuring levels of pollutants lethal to aquatic organisms. The critical review is intended for students or scientists entering the field of toxicity testing of aquatic organisms. Three hundred and seventy-five toxicity tests are reviewed.

For 211 of the toxicity tests reviewed, acute lethal action apparently ceased within 4 days. The author recommends the incipient LC50 (lethal concentration for 50 percent of the individuals on long exposure) as the most useful single criterion of toxicity. If this criterion cannot be assessed, the 4-day LC50 is suggested as a useful substitute.

[6 figures, 1 table, 125 references]

[Abstracter: F. T. Piskur]

9.19

a reference and to coordinating the various bodies involved in the study. (3) The IJC should be empowered to exercise supervision over the implementation of its recommendations by the users of the resource which has been the subject of its study and be authorized to report offenders to the Attorney-General of the national government with recommendations for action to be taken. The reporting of violations procedure to be effective would necessitate the two governments' securing legislation which would give statutory effect to the standards for quality control enunciated by the IJC and enable the Attorneys-General to launch proceedings to compel compliance with the standards. [contains 111 footnotes]

9.2 THE CULMINATION OF PRODUCT DEVELOPMENT & MARKET RESEARCH IN CONSUMER COMMUNICATIONS

Jenkins, Farish A. (National Biscuit Company, 425 Park Avenue, New York, N.Y.10022)
Food Technology 24, No. 4, 60, 64, 66 (April 1970)

The formula for the success of introducing a new product involves a gain a competitive edge in product development through (1) advertising, (2) multimedia or message introduced through consumer communications. The author explains the concept of consumer research and (3) product development through extensive market research and risk analysis.

[Abstracter: F. T. Piskur]

9.3 OCEAN LAWS IN DEEP WATERS
(9.6)

Loftas, Tony (reviewer)
Towards a Better Use of the Ocean
William T. Burke
Gerald Duckworth [publisher], 3 Henrietta Street, London, W.C.2, England, 231 pp. (n.d.) 70s
New Scientist 45, No. 692, 519 (March 12, 1970)

In June 1968, the Stockholm International Peace Research Institute held a meeting titled "Towards a Better Use of the Ocean." Professor W. T. Burke of Ohio State University gave the keynote address, "Contemporary Legal Problems in Ocean Development." This paper, along with comments from a panel of International experts, forms the main part of this book.

The legal and technical aspects of four main topics were discussed: mineral resources, fishery resources, military uses of the sea bed, and scientific research. Although deep-sea minerals are not likely to be exploited for at least a decade or so, much of the discussion was centered on this subject. Fisheries problems were somewhat neglected. The reviewer acknowledges that separating the fisheries from the other problems has advantages. But past experience has shown that fishery matters are inextricably tied to questions about the territorial seas and related topics. Moreover, increasing involvement of the developing countries in world fishing situations makes a study of fisheries legislation imperative. Fish resources have much in common with deep-sea mineral resources--although they are widely distributed, they tend to be concentrated in certain areas. However, unlike mineral resources, they can be exploited even by poor nations. In addition,

9.3 STUDY OF OUTER CONTINENTAL SHELF LANDS OF THE UNITED STATES
(9.2)

Public Land Law Review Commission, Washington, D.C.
Available from the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Va. 22121. Price $3.00 per volume, (November 1969).
Volume I, 289 pp. (Order No. PB-188 714)
Introduction; Legal Aspects; and Resource Aspects.
Volume II, 336 pp. (Order No. 188 715)

Background of the Submerged Lands Act and Outer Continental Shelf Lands Act; Administration of the Outer Continental Shelf Lands Act; Living resources of the Continental Shelf; Anticipated development of offshore mineral industry and technology.

Volume III, 249 pp. (Order No. PP-188 716)

Economic analysis of leasing experience under the Outer Continental Shelf Lands Act; Economic analysis of prorationing production; User interaction and environmental impact; Analysis of the existing system of administration of Outer Continental Shelf lands; Analysis of alternatives to existing system.
Volume IV, 397 pp. (Order No. PB-188 717)

Truman proclamation; Convention on the Continental Shelf; Fishery zones; U.N. resolutions and reports....
Volume V (Appendices), 399 pp. (Order No. PB-188 718)

Bibliography and source list; Comparative laws and policies (domestic)....

9.6 THE SAFETY OF FOODS
(0.6)(2.9)

Graham, H. D. (ed.)
Avi Publishing Co., Inc., Westport, Connecticut. xii + 367 pp. (1968) $16
Food and Cosmetics Toxicology 7, No. 6, 635-636 (November 1969)

This book reports the proceedings of An International Symposium on the Safety and Importance of Foods in the Western Hemisphere, held at the University of Puerto Rico, Mayagüez, Puerto Rico, in 1966. The six major sections of the book cover the following aspects of food safety: (1) food regulations in North, Central, and South American countries; (2) food toxicants, which contains chapters on poisonous marine animals and the hazards of irradiated food, including biological evaluations of the protein quality of irradiated foods; (3) microbial toxins; (4) food spoilage and food-borne infection; (5) adequate food supply, which contains a chapter on the proper use of food additives; and (6) unintentional food additives--for example, those from pesticides, packaging materials, and antibiotic residues.

The reviewer says that, despite its poor subject index, the book contains much of value for those working in the food and food-additive fields.

9.6 CRC CRITICAL REVIEW JOURNALS

Anonymous
Chemical Rubber Co., 18901 Cranwood Parkway, Cleveland, Ohio 44128 (January 1970)

In January 1970, the Chemical Rubber Company (CRC) began publishing six Critical Review Journals. The quarterly issue of each journal will contain from four to eight articles, in which the most significant papers in the particular discipline are extracted from the current literature. The articles will focus attention on the major developments in the field and will include detailed critical evaluations of new concepts, methods, and data. The Table of Contents in each journal will include a 50-word abstract of each article. Sample titles and authors appearing in the first issues of three of the journals are cited below.

CRC Critical Reviews in Analytical Chemistry, edited by Louis Meites, Chairman, Department of Chemistry, Clarkson College of Technology; Gunter Zweig; and Irving Sunshine. (Advisory Board: R. Belcher, V. A. Fassel, Taitiro Fujinaga, Sidney Siggia, and Philip J. Elving).

"Electrolytic Chromatography and Coulometric Detection," by Taitiro Fujinaga, Kyoto University, Japan

"Recent Developments in Solvent-Extraction, Equilibria and Kinetics," by Henry Freiser, Department of Chemistry, University of Arizona

"Recent Developments in Qualitative Thin-Layer Chromatography," by Rokus A. de Zeeuw, Laboratory for Pharmaceutical and Analytical Chemistry, Rijksuniversitiet, The Netherlands

(over)

9.3

Volume VI (Appendices), 220 pp., (Order No. PB-188 719)

Offshore mineral leasing experiences of coas states. Comparative laws and policies (foreign). Compilation of alternatives; Department of the Interior Reports.

[Author's abstract]

9.3 TECHNOLOGY, OCEAN MANAGEMENT, AND THE LAW OF THE SEA: SOME CURRENT HISTORY

Miles, Edward (Graduate School of International Studies, University of Denver, Colo. Denver Law Journal 46, No. 2, 240-260 (Spring 1969)

The author discusses aspects of the recent history of ocean law that reveal the impact of technological advances on the process of developing international standards to govern the use and management of the oceans. He shows how technology considerations have influenced the types of jurisdictional claims over coastal waters that have been made by various countries. The present state of ocean technology is briefly considered in terms of its implications for the future development of ocean law. The author notes that the law of outer space will be shaped in a similar way by considerations of technological development.

[4 tables, 74 footnotes] [Abstracter: F. T. Piskur]

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over-exploitation of traditional northern fishing grounds has led fishing nations to turn toward tropical and subtropical areas. This potential for conflict between migrant fleets from advanced countries and the fleets of developing countries is an ever-present cause for concern.

The reviewer says that despite the sketchy treatment of fisheries problems--and of military uses of the oceans--the book must rank as one of the best existing summaries of the legal problems associated with ocean development. The biggest mistake that comes to light is its neglect of the ideas and experience of those presently involved in exploiting the oceans and developing marine technology. One of the greatest services such a book could do would be to provide the means for legal experts to learn about likely progress in the technology of exploitation from those people and companies involved in it. Only with this knowledge can the experts hope to produce more than stop-gap legislation.

9.4 SOME ELEMENTS OF AN EVALUATION OF THE EFFECTS (9.3) OF LEGAL FACTORS ON THE UTILIZATION OF FISHERY RESOURCES

Sokolowski, Adam A. (Branch of Supply and Resource Use Research, Division of Economics Research, Bureau of Commercial Fisheries, College Park, Maryland) Transactions of the American Fisheries Society No. 2, 360-367 (1969)

Present fishing patterns, as with virtually all human activity, are reflections of the evolutionary course of history. The management of fisheries resources is often carried on in a framework containing codified remnants of this past. This situation is amplified by the common property nature of the resource which dictates that no single resource user has exclusive rights to the resource.

A legal structure has arisen which is generally representative of a past endorsement of freedom of the seas, a more contemporary interest in conservation, and a recently heightened interest in the economic well-being of the U.S. fishing industry. This structure differs for each fishery. In some cases economic viability is permitted while in others required harvesting practices of another era represent extremes of inefficiency. Examples of fisheries such as halibut, salmon, anchovy and shrimp indicate the varying degrees to which truly economic alternative resource uses may be possible. Dollar values can be attributed to the losses associated with the encouraged use of certain inefficient practices.

[Author's abstract]

9.6 FAO DEPARTMENT OF FISHERIES
LIST OF PUBLICATIONS AND DOCUMENTS 1948-1969

Anonymous
FAO Fisheries Circular No. 100 (Rev. 1) (1969)

This document is the first revision of FAO Fisheries Circular No. 100 originally issued in 1966. The revision lists all FAO fishery publications and main documents, including some working papers, up to December 1, 1969.

[Abstracter: F. T. Piskur]

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CRC Critical Reviews in Environmental Control, edited by Richard G. Bond, Director of Environmental Health, University of Minnesota; and Conrad P. Straub.

"Changing Patterns in Food Preparation, Processing, and Distribution," by I. J. Pflug, School of Public Health, University of Minnesota

"Siting of Civilian Nuclear Power Reactors, Environmental Health Aspects," by Peter J. Barry, Atomic Energy of Canada Ltd.

"Persistence of Pesticides in the Environment," by Clive A. Edwards, Entomology Department, Rothamsted Experimental Station, Harpenden, Herts., England

CRC Critical Reviews in Food Technology, edited by Thomas E. Furia, Technical Development Manager, Geigy Industrial Chemicals.

"Freeze-Drying of Foodstuffs," by C. Judson King, Department of Chemical Engineering, University of California

"Salmonella and Its Relation to the Food Industry," by John H. Litchfield, Department of Chemistry, Battelle Memorial Institute

"Nutritional Aspects in Contemporary Food Science," by R. H. Bunnell, Food Agricultural Products Division, Hoffman-LaRoche Inc.

"Texture and Mechanical Behavior of Fabricated Foods," by Harold Corey, Consultant to the Food Industry.

The other three journals cover subjects in solid state sciences, clinical laboratory sciences, and radiological sciences.

The subscription price is $56 for 1 year for one journal, $100 for one journal for 2 years, or $300 for all six journals for 1 year.

9.6 FISH AND MAN: CONFLICT IN THE ATLANTIC ESTUARIES
(9.17)(9.12)
(9.3)

Clark, John
International Marine Publishing Co., Camden, Maine (n.d.), 84 pp. $1
National Fisherman 50, No. 11, S2 (March 1970)

As the title suggests, this book tells two stories. One concerns salt-water fish and the environment they must have to survive. The other concerns man and the effect his progress has had on the environment of the fish. The book's thesis is that fish resources along the shores of the Atlantic and its arms are in danger of extreme depletion from poorly planned community and industrial development. This paper-bound volume includes a state-by-state survey of the ecology of estuaries, species that are dependent on an estuarine environment, effects of lost estuaries, estuary-conservation action, special problems, and future plans. It is illustrated and has a detailed bibliography. [Abstracter: L. Baldwin]

9.2 PROGRAM OF DIVISION OF ECONOMIC RESEARCH, BUREAU OF COMMERCIAL FISHERIES, FISCAL YEAR 1969

Bell, Frederick W. (Division of Economic Research, Bureau of Commercial Fisheries, U.S. Department of the Interior, Washington, D.C. 20240)
U.S. Fish and Wildlife Service, Circular 337, 29 pp. (April 1970)

The Division studies the economic behavior of the U.S. fishing industry to provide information needed by Government policy makers and industry members to solve many of the problems facing the fishing industry. This first report describes briefly the organization and functions of the Division in relation to the Government's policies concerning the commercial fisheries.

The report summarizes (1) the projects completed in the Branch of Demand and Marketing Research and the Branch of Supply and Resource Use Research during Fiscal Year 1969; and (2) those projects included in Fiscal Year 1970 work program. [contains 12 figures, 7 tables, and lists of Working Papers and Publications]

 Author's abstract

9.3 DEVELOPMENT OF INTERNATIONAL RIVER BASINS: REGULATION OF RIPARIAN COMPETITION

Shapiro-Libai, Nitza (Tel-Aviv, Israel)
Indiana Law Journal 45, No. 1, 20-55 (Fall 1969)

Approximately 150 river basins straddle international boundaries, and they cover almost one-half of the land surface of the world. Their development will be one of the major means of accomplishing economic growth and social change in the next few decades, especially in the developing countries (Sewell and White, 1966). The author states that many experts believe that the entire river system including the main stream and all its tributaries, should be considered in developing an international river. Progressive regulation of such rivers should, therefore, be directed at stimulating development on a unit river basin approach. The territorial supremacy and the territorial integrity doctrines are incompatible with the comprehensive approach. (The principle of territorial supremacy empowers a state to exercise supreme authority over all components of its territory. The principle of territorial integrity gives a state a right to demand that other states abstain from committing any act that is a violation of its territorial integrity.) The author suggests that the doctrine of equitable apportionment is in line with the comprehensive approach, because it is oriented toward satisfying equally the interests of all riparians. However, this doctrine of equitable apportionment establishes only the equal right of each riparian to an equitable share in the benefits of a river--it does not specifically call for joint development, but is capable of encouraging such cooperation. The usefulness of this doctrine is limited in that it lacks the quality of self-application and depends upon agreements or authoritative decisions for the concrete interpretation of its terms. [contains 127 footnotes]

 Abstracter: F. T. Piskur

9.4 (0.9)(7.7) (3.2) THE REFRIGERATED RESEARCH FOUNDATION -- A MECCA FOR DATA ON FROZEN FOODS

Anonymous
Quick Frozen Foods 32, No. 6, 115-116 (January 1970)

Companion libraries in Washington, D.C., constitute the most extensive source of information on frozen foods in the world. The Refrigerated Research Foundation (TRRF) library contains more than 25,000 index cards carrying abstracts of and cross references to manuscripts, scientific papers, books, and trade journal articles from both domestic and foreign sources. Many of the originals are on file in the library. The biggest financial supporter of the Foundation is the National Association of Refrigerated Warehouses (NARW), whose library complements and is housed with TRRF library. Together they supply data answering inquiries about such matters as refrigerated warehousing of nuts, fruits, meat, fish, vegetables, and dairy products; freezing rates and methods; controlled atmosphere storage; enzymes; plastics; and chemicals. The NARW library contains material on the operational level of warehousing--construction materials, material handling and associated equipment, refrigerated transportation, freezing, systems routing, and the legal concomitants. The Foundation library specializes in technical and scientific data on cryogenics and refrigeration systems and applications. A 17-man Scientific Advisory Council, each member a specialist in cryogenics or refrigeration, not only contributes to the fund of information in TRRF but assists the full-time librarian in screening incoming material for relevance and significance. Both libraries are open to the general public. [1 photograph]

 Abstracter: L. Baldwin

9.6 BOAT MAINTENANCE AFLOAT AND ASHORE. VOLUMES 1, 2, AND 3

Chapman, Charles F. (ed.)
International Marine Publishing Company. $4 each or $10 a set.
National Fisherman, 9S (May 1970)

These three volumes are a guide to the upkeep, overhaul, buying, selling, repair, and improvement of boats and motors. Each volume contains about 300 pages, including many drawings.

Volume 1 covers awnings and cockpit covers, ballast, batteries, boathouses, buying and selling, castings, caulking, comforts afloat, controls, cruising hints, dinghys, docks and slips, electrical accessories, electrolysis, engines, fitting out, floats, fuel systems, and galleys.

Volume 2 covers heating, iceboxes, ignitions, leaks, masts, moorings, outboard motors and accessories, painting, plumbing, propellers, pumps, radios and other electronic instruments, railways (including cradles and dolleys), rot and decay, sails, steering gear, supplies, ventilation, vibration, winter lay-up, and woods.

Volume 3 covers cookery on board, drogues, fenders and guard rails, fishing gear and equipment, insurance, lighting, rope and its care, rudders, sheathing with copper, taking off a boat's lines, and trailers and transportation. This volume contains an index of subjects covered in all three volumes.

 Abstracter: L. Baldwin

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Oyagilev, N. I. (pat.)	2	0.12
Pardue, G. B.	24	9.16
Patton, Stuart	24	9.12
Patwardhan, Vinayak N.	5	0.7
Pearson, D.	20	7.81
Perigreen, P. A.	13	3.2344
Pillai, V. K.	13	3.2344
	13	3.3343
Pippen, E. L.	19	7.45
Pointel, J.-G.	12	3.15
Pomeranz, Y.	17	6.54
Potts, J. T., Jr.	4	0.4
Power, H. E.	21	8.46
Pratt, Dan E.	26	9.19
Quayle, D. B.	24	9.16
Randtke, Ann	15	6.31
Rangaswamy, J. R.	21	8.51
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Raymont, J. E. G.	22	8.0
Raymont, J. K. B.	22	8.0
Regier, L. W.	21	8.46
Rehfeld, Betty M.	26	9.19
Riter, Charles B.	3	0.6
Rivas, Luis R.	10	1.4
Roels, Oswald A.	18	6.54
Rogozhin, S. V.	4	0.6
Roubal, William T.	1	0.111
Rusch, D. T.	5	0.6
Sabry, Z. I.	5	0.7
Saha, J. G.	25	9.19
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Sam, M. Pham Van	12	3.15
Sanford, F. Bruce	16	6.30
Schonbaum, Gregory R.	1	0.321
Shibata, Takeshi	13	3.2499
Shiga, A.	12	2.8
	12	2.8
Shapiro-Libai, Nitza	29	9.3
Simko, Alexander J.	23	9.17
Slonimskii, G. L.	4	0.6
Snyder, Oscar Peter, Jr.	11	3.15
Sokoloski, Adam A.	28	9.4
Solanki, K. K.	15	3.64
Solon, Joseph M.	26	9.19
Sōma, Suga	21	8.8
Sprague, J. B.	26	9.19
Srinivasagam, R. T.	22	8.0
Stadelman, W. J.	11	2.3
Stansby, Maurice E. (ed.)	3	0.6
Steffen, A. J.	8	0.8
Stephens, K. S.	21	9.11
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Terachi, Hitoshi	7	0.8
Terent'ev, A. V. (pat.)	2	0.12
Thalheimer, W. G.	5	0.6
Thanassi, N. M.	2	0.37
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Van Meter, Harry D.	8	1.0118
Vargas-Nunez, Gaston	20	6.191
Varma, P. R. G.	13	3.3343
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Venugopalan, V.	17	6.54
Visweswaraiah, K.	20	7.461
Welch, Walter R.	7	1.86
Wickett, W. Percy	21	9.11
Willick, Gordon E.	1	0.321
Wistreich, H. E.	14	3.4
Yagi, Kazufumi	20	7.871
Yamashita, Michiko	3	0.38
Yoneda, Tsutomu	20	7.52
Yoshida, Minoru	5	0.7
	7	0.7
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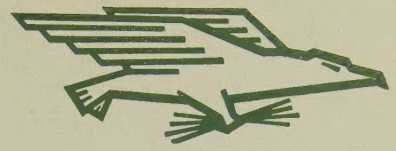

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